

REFINITIV

DELTA REPORT

10-K

AAOI - APPLIED OPTOELECTRONICS,
10-K - DECEMBER 31, 2023 COMPARED TO 10-K - DECEMBER 31, 2022

The following comparison report has been automatically generated

TOTAL DELTAS	2391
CHANGES	459
DELETIONS	814
ADDITIONS	1118

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 31, 2022 2023

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: 001-36083

Applied Optoelectronics, Inc.

(Exact name of registrant as specified in its charter)

Delaware

76-0533927

(State or other jurisdiction of incorporation or organization)

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

13139 Jess Pirtle Blvd.

Sugar Land, TX 77478

(Address of principal executive offices)

(281) 295-1800

(Registrant's telephone number)

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

Title of each class	Trading Symbol(s)	Trading Name of each exchange on which registered
Common Stock, Par value \$0.001	AAOI	NASDAQ Global Market

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act of 1933: 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, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

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

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

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

As of June 30, **2022 2023**, the aggregate market value of the common stock held by non-affiliates of the Registrant was **\$38,951,697 \$169,814,245** based upon the closing sales price of the Registrant's common stock as reported on the NASDAQ Global Markets on June 30, **2022 2023** of **\$1.55 \$5.96** per share. Shares of common stock held by officers, directors and holders of more than ten percent of the outstanding common stock have been excluded from this calculation because such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February **21 20, 2023 2024**, the Registrant had **28,973,196 38,398,085** outstanding shares of Common Stock.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive Proxy Statement for the Registrant's **2023 2024** Annual Meeting of Stockholders are incorporated by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. The Proxy Statement will be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days of the Registrant's fiscal year ended December 31, **2022 2023**.

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Forward-Looking Information

This Annual Report on Form 10-K ("Form 10-K") contains forward-looking statements that are based on our management's beliefs and assumptions and on information currently available to our management, including statements appearing under the heading, "Management's Discussion and Analysis of Financial Condition and Results of Operations". The statements contained in this Form 10-K that are not purely historical are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange

Act. In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “should,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “strategy,” “future,” “likely,” or “would” or by other similar expressions that convey uncertainty of future events or outcomes. These forward-looking statements involve risks and uncertainties, as well as assumptions and current expectations, which could cause the Company’s actual results to differ materially from those anticipated in such forward-looking statements. These risks and uncertainties include but are not limited to: statements about reduction in the size or quantity of customer orders; change in demand for the Company’s products due to industry conditions; our ability to maintain sufficient liquidity; changes in manufacturing operations; volatility in manufacturing costs; delays in shipments of products; disruptions in the supply chain; change in the rate of design wins or the rate of customer acceptance of new products; the Company’s reliance on a small number of customers for a substantial portion of its revenues; pricing pressure; a decline in demand for our customers’ products or their rate of deployment of their products; general conditions in the **internet data center**, cable television or CATV, **internet data center**, telecommunications or telecom and fiber-to-the-home or FTTH; changes in the world economy (particularly in the United States and China); the negative effects of seasonality; **the anticipated impact to our business operations, customer demand and supply chain due to the recent global pandemic of a novel strain of the coronavirus (COVID-19)**; expectations regarding the acquisition or divestiture of assets and business; realization of deferred tax assets; and other risks and uncertainties described more fully under the heading “Risk Factors” in this Form 10-K and those discussed in the Company’s other documents filed with or furnished to the Securities and Exchange Commission. You should not rely on forward-looking statements as predictions of future events. All forward-looking statements in this Form 10-K are based upon information available to us as of the date hereof, and qualified in their entirety by this cautionary statement. Except as required by law, we assume no obligation to update forward-looking statements for any reason after the date of this report to conform these statements to actual results or to changes in the Company’s expectations.

PART I

Item 1. Business

Overview

Applied Optoelectronics, Inc. (the “Company” or “AOI”) is a leading, vertically integrated provider of fiber-optic networking products, primarily for four networking end-markets: **internet data center**, cable television, (“CATV”), **internet data center**, telecommunications, (“telecom”), and fiber-to-the-home (“FTTH”). We design and manufacture a range of optical communications products at varying levels of integration, from components, subassemblies and modules to complete turn-key equipment.

In designing products for our customers, we **generally** begin with the fundamental building blocks of lasers and laser components. From these foundational products, we design and manufacture a wide range of products to meet our customers’ needs and specifications, and such products differ from each other by their end market, intended use and level of integration. We are primarily focused on the higher-performance segments within all four of our target markets, which increasingly demand faster connectivity and innovation.

The four end markets we target are all driven by significant bandwidth demand fueled by the growth of network-connected devices, video traffic, cloud computing and online social networking. To address this increased bandwidth demand, CATV and telecom service providers are competing directly against each other by providing bundles of voice, video and data services to their subscribers and investing to enhance the capacity, reliability and capability of their networks. **The trend of rising bandwidth consumption also impacts the Our internet data center market is also experiencing substantial growth as reflected in the shift hyperscale data center operators build and upgrade their infrastructure to higher speed server connections. support artificial intelligence (“AI”) applications which are compute and bandwidth intensive.** As a result of these trends, fiber-optic networking technology is becoming essential in all four of our target markets, as it is often the only economical way to deliver the desired bandwidth.

The CATV market is our largest and the most established market, for which we supply a broad array of products, including lasers, transmitters and transceivers, and turn-key equipment. Sales of headend, node and distribution equipment have contributed significantly to our revenue in recent years as a result of our ability to meet the needs of CATV equipment vendors who have continued to outsource both the design and manufacturing of this equipment. As the complexity of CATV networks has increased over the years, equipment vendors, many of whom are our customers, have been under pressure to supply a wider variety of increasingly complex equipment to CATV multiple system operators (“MSOs”). In order to meet these demands, many equipment vendors have looked to engage with suppliers like AOI who have the capability to design and manufacture various network equipment or subassemblies, rather than always developing these devices themselves. This outsourcing trend has been a significant contributor to the revenue we derive from the CATV market. We believe that our extensive high-speed optical, mixed-signal semiconductor and mechanical engineering capabilities position us well to continue to benefit from these industry dynamics.

The internet data center market is **currently our second largest and fastest-growing** market. Our customers in this market are generally large internet-based (“**Web 2.0**” hyperscale”) data center operators, **along with equipment suppliers who supply our products along with others to whom our hyperscale data center operator customers. In both cases,** we supply optical transceivers that plug into switches and servers within the data center and allow these network devices to send and receive data over **fiber-optic fiber optic** cables. The majority of the data center optical transceivers that we sell utilize our own lasers and subassemblies (we refer to the transceivers subassemblies as “light engines”), and we believe that our in-house technology and manufacturing capability for these lasers and subassemblies gives us an advantage over many of our competitors who often lack either development or manufacturing capabilities for these advanced optical modules. **The rapid adoption of AI is fueling a new wave of investment by hyperscale data center operators, as AI computing is very compute and bandwidth intensive.**

The CATV market is our second largest and the most established market, for which we supply a broad array of products, including lasers, transmitters and transceivers, and turn-key equipment. Sales of headend, node and distribution equipment, including amplifiers, have contributed significantly to our revenue in recent years as a result of our ability to meet the needs of CATV equipment vendors who have continued to outsource both the design and manufacturing of this equipment. In 2023, we began offering many of our CATV

products directly to CATV multiple system operator ("MSO") customers, under the newly-created Quantum Bandwidth™ brand name. We made this strategic decision in order to better address the needs of our MSO customers as we believe they are embarking on a complex and lengthy series of network upgrades that will likely require significant innovation from their equipment suppliers. By selling products directly to these customers, we believe that we will be able to address these needs more efficiently and will improve our time to market for these new innovations, which MSOs have indicated will be critical to timely rollout of their planned network upgrades.

As the complexity of CATV networks has increased over the years, equipment vendors, many of whom are our customers, have been under pressure to supply a wider variety of increasingly complex equipment to CATV multiple system operators ("MSOs"). In order to meet these demands, many equipment vendors have looked to engage with suppliers like us who have the capability to design and manufacture various network equipment or subassemblies, rather than always developing these devices themselves. This outsourcing trend has been a significant contributor to the revenue we derive from the CATV market. We believe that our extensive high-speed optical, mixed-signal semiconductor and mechanical engineering capabilities position us well to continue to benefit from these industry dynamics. Our recent launch of our own branded line of equipment offers an additional growth opportunity for us, enabling us to sell directly to MSOs in certain cases rather than to CATV equipment vendors.

In the telecom market we supply lasers and laser subassemblies as well as transceivers. Our customers in this segment consist mostly of network equipment manufacturers ("NEMs") and other manufacturers of optical transceivers. Our NEM customers manufacture equipment used in telecommunications networks and our transceiver manufacturer customers use our lasers and subassemblies in the manufacture of their optical transceivers. Most of our products in this segment are purchased for use in advanced 5G mobile network deployments.

Our vertically integrated manufacturing model provides us several advantages, including rapid product development, fast response times to customer requests and greater control over product quality and manufacturing costs. We design, manufacture and integrate our own analog and digital lasers using proprietary Molecular Beam Epitaxy or MBE, ("MBE") and Metal Organic Chemical Vapor Deposition (MOCVD) ("MOCVD"), alternative processes for the fabrication process, which we of lasers. We believe the use of both processes, and our knowledge of how to combine these processes with others to fabricate lasers is unique in our industry. We manufacture the majority of the laser chips and optical components that are used in our products. The lasers we manufacture are tested extensively to enable reliable operation over time and our devices are often highly tolerant of changes in temperature and humidity, making them well-suited to the CATV, FTTH and 5G markets where networking equipment is often installed outdoors. All of our laser chips are manufactured in our facility in Sugar Land, Texas. We believe that our domestic production capacity for these devices gives us a competitive advantage over many of our competitors, as we believe that many of our customers prefer to source key components from suppliers who have domestic manufacturing capacity.

In 2023, 2022, 2021 and 2020, our revenue was \$217.6 million, \$222.8 million, \$211.6 million, and \$234.6 million and our gross margin was 15.1%, 17.8%, 15.1%, and 21.5%, respectively. In the years ended December 31, 2023, 2022, 2021 and 2020, we had net loss of \$66.4 million, \$56 million, \$66.4 million, and \$54.2 million, and \$58.5 million, respectively. At December 31, 2022, 2023 and 2021, our accumulated deficit deficits were \$209.1 million and \$142.7 million, respectively. In 2022, 2023, we earned 53.0% of our total revenue from the CATV market and 34.6% of our total revenue from the internet data center market and 27.5% of our total revenue from the CATV market.

In 2023, our key customers in the internet data center market included Microsoft, a U.S. based large data center operator, and a China based datacenter equipment manufacturer. In 2023, 2022 and 2021, Microsoft accounted for 46.6%, 18.4% and 14.1% of our revenue, a U.S. based large data center operator accounted for 8.8%, 5.9%, and 8.3% of our revenue, and a China based manufacturer accounted for 3.3%, 1.2%, and 1.2% of our revenue, respectively. In 2023, our key customers in the CATV market included ATX, Networks Corp. Digicomm and a U.S. based large CATV equipment provider. In 2023, Cisco Systems, Inc., 2022, and CommScope. In 2022, 2021 and 2020, ATX accounted for 15.6%, 47.3%, 25.6% and 3.7% of our revenue, Cisco Digicomm accounted for 1.9%, 11.3%, 11.9% 0%, and 7.5% 0% of our revenue, and CommScope accounted for 1.7%, 3.3%, and 2.1% of our revenue, respectively. In 2022, our key customers in the data center market included Microsoft Corp, a U.S. based large datacenter operator, and a U.S. based NEM. In 2022, CATV equipment provider accounted for 1.3%, 2021, 1.7%, and 2020, Microsoft accounted for 18.4%, 14.1%, and 38.3% of our revenue, the U.S. based large datacenter operator accounted for 5.9%, 8.3%, and 8.0% of our revenue, the U.S. based NEM accounted for 3.6%, 7.2%, and 7.9% 3.3% of our revenue, respectively.

Divestiture Agreement with Yuhan Optoelectronic Technology (Shanghai) Co., Ltd

On September 15, 2022, we entered into a definitive purchase agreement with Yuhan Optoelectronic Technology (Shanghai) Co., Ltd ("Purchaser"), which is a company incorporated in the People's Republic of China ("PRC"), to divest the Company's manufacturing facilities in the PRC and certain assets related to our transceiver business and multi-channel optical sub-assembly products (collectively, the "Divestiture"). The closing of the transaction is subject to the satisfaction of certain closing conditions, including the approval from the Committee on Foreign Investment in the United States ("CFIUS").

The purchase price will be an amount equal to the \$150 million USD equivalent of Renminbi, less a holdback amount. Prior to the closing of the transaction the Company anticipates investing an amount equal to between 4% and 10% of the estimated proceeds from the transaction in exchange for a 10% equity interest in the Purchaser.

Our management has performed an evaluation as required by ASC-360-10-45-9 to determine whether to classify certain of our assets and liabilities as held for sale as of December 31, 2022. ASC 360 requires that a company classifies a business as held for sale in the period in which management commits to a plan to sell the business, the business is available for immediate sale in its present condition, an active program to complete the plan to sell the business is initiated, the sale of the business within one year is probable and the business is being marketed at a reasonable price in relation to its fair value. Although we have announced the execution of a definitive purchase agreement regarding the Divestiture, completion of this transaction is not certain for reasons that include the fact that the proposed sale is subject to regulatory approval in the US and China, the timing and likelihood of which is uncertain and beyond our control, and the fact that we cannot be certain that the buyer will not request modification of terms within the definitive purchase agreement. As a result, we have concluded that at the present time the business is not "available for immediate sale" under the meaning defined in ASC 360 and therefore none of our assets or liabilities should be classified as held for sale.

Industry Background

During 2022-2023, our four target markets, CATV, internet data center, CATV, telecom and FTTH, experienced a significant growth in bandwidth consumption and the corresponding need for network infrastructure improvement to support this growth.

The prevailing trends in our target markets include:

- **Trends in the CATV Market.** In recent years, CATV service providers have invested extensively to support high speed, two-way communications and we expect that they will continue to do so. In North America, CATV service providers have upgraded their networks with new technologies like DOCSIS 3.1, which enables them to offer higher speed connections to their customers. In order to increase available bandwidth for their customers beyond the bandwidth possible with the introduction of DOCSIS 3.1, cable MSOs have been reducing the number of customers that are connected to a single node. By reducing the number of "homes per node," the average bandwidth available to each customer is increased. Other new technologies, such as Converged Cable Access Platform ("CCAP") and Remote-PHY are under development by cable equipment suppliers. These technologies are being developed to be a cost-effective solution to provide higher available bandwidth to CATV customers.

As the complexity of CATV networks has increased over the years, equipment vendors, many of whom are our customers, have been under pressure to supply a wider variety of increasingly complex equipment to CATV MSOs. In order to meet these demands, many equipment vendors have looked to engage with suppliers like AOI, who have the capability to design and manufacture various network equipment or subassemblies, rather than always developing these devices themselves. This outsourcing trend has been a significant contributor to the revenue we derive from the CATV market.

- **Trends in the Internet Data Center Market.** To support the substantial increase in bandwidth consumption, internet data center operators are increasing the scale of their internet data centers and deploying infrastructure capable of higher data transmission rates. As a result, there is an ongoing transition from the use of copper cable, typically at speeds of up to 1 gigabit per second ("Gbps"), to optical fiber as a transport medium, typically providing speeds from 10 Gbps to 400 800 Gbps. In recent years, a number of leading internet companies have adopted more open internet data center architectures, using a mix of systems and components from a variety of vendors, and in some cases designing their own equipment. For these companies, compatibility of new networking equipment with legacy infrastructure is not as important, and consequently, these companies are more willing to work with non-traditional equipment vendors, which we believe creates an opportunity for optical device vendors. Moreover, transmission speeds have continued to increase among the companies who have previously transitioned from copper-based to fiber-based infrastructure, resulting in opportunities for optical device vendors to supply new optical transceivers capable of operating at these higher data rates. In recent years, supply chain disruptions caused by the pandemic and other factors have become increasingly concerning to our customers. As a result, we believe that our ability to manufacture lasers and other data center products in the US represents a competitive advantage compared with many of our competitors who have most or all of their production outside the US. Hyperscale data center operators have consistently sought and deployed the most advanced technologies to support the compute and bandwidth needs within their facilities, driving the growth of optical networking within data centers. These operators have adopted more open internet data center architectures and have designed their own networking equipment, both of which use a mix of systems and components from a variety of vendors. We have benefited from these trends over the past several years, and expected to continue to benefit from them. Recently the hyperscale data center operators have begun to build and upgrade their data centers to support AI, offering us a new growth opportunity. The leading edge AI applications require significantly more compute capacity and bandwidth, driving the need for faster (400Gbps and higher) and innovative optical networking solutions to support the intra-data center connectivity needs.

- **Trends in the CATV Market.** Beginning over two decades ago, CATV service providers have invested extensively to support high speed, two-way communications over their networks and we expect that they will continue to do so. In North America, CATV service providers have most recently upgraded their networks with technologies like DOCSIS 3.1, which enables them to offer high speed internet connections to their customers. In order to increase available bandwidth for their customers beyond the bandwidth possible with DOCSIS 3.1, cable MSOs have supported the development of DOCSIS 4.0, which is primarily aimed at increasing the amount of bandwidth available to offer to customers, and also to making the distribution of bandwidth between "forward-path" (i.e. from the MSO office to the customer) and "return-path" (i.e. from the customer to the MSO office) more flexible. In part, enabling the flexible deployment of bandwidth between forward-path and return-path is an effort by MSOs to enable their networks to more effectively scale with consumer demand trends in the future. MSOs like Comcast and Charter have announced plans to spend billions of dollars over the next few years to upgrade to DOCSIS 4.0 network equipment. As one of the early developers of DOCSIS 4.0 equipment, we believe that this represents a significant opportunity for sales of CATV equipment in the next few years.

- **Trends in the Telecom Market.** The telecom market is composed of customers who deploy wireline optical networks, other than Passive Optical Networks, or PONs, for telecom access networks, including for backhaul of cellular telephone signals. As demand for mobile internet connectivity has increased in recent years, reliable and high-speed optical networks have become increasingly important. In particular, the use of wavelength division multiplexing ("WDM") to expand the capacity of mobile networks has led to increased demand for WDM components (including lasers and transceivers) by telecom equipment manufacturers. In coming years, we believe that the deployment of advanced 5G networks will result in increased demand for optical components, especially those used in connecting between antennas and base stations, as well as for backhaul as mentioned above. backhaul.

- **Trends in the FTTH Market.** The FTTH market generally refers to the PONs that telecom service providers deploy. The most commonly deployed PON technology is Gigabit PON, or GPON, which delivers up to 2.5 Gbps of data, but due to the splitting of the bandwidth among multiple users, the actual bandwidth delivered to an individual subscriber is far less than 2.5 Gbps. One approach that does support true 1 Gbps service to the home is wavelength division multiplexing PON, or WDM-PON, a technology that enables the transmission of multiple wavelengths of data over a single fiber-optic strand. Another approach is XGS-PON, which offers 10 Gbps over a single fiber strand. We also see opportunities for 10 Gbps Ethernet Passive Optical Network ("EPON") and higher data rate PON networks in the future. Also, we have seen trends towards cable television MSOs beginning to deploy PON networks. We see opportunities with these customers particularly given our knowledge and experience in CATV as discussed above. CATV.

Our Solutions

We experience certain challenges within our target markets, including continuous pressure to innovate and deliver highly integrated products that perform reliably in harsh, demanding environments and to produce high-quality devices in large volumes at competitive prices.

By addressing the challenges in our target markets, we provide the following benefits to our customers:

- **Enable customers to deliver innovative products.** We leverage our extensive expertise in high-speed optical, mixed-signal semiconductor and mechanical engineering, and MOCVD and our proprietary MBE laser fabrication process to deliver technologically advanced products to our customers.
- **Enhance efficiency and cost effectiveness of our customers' supply chains.** We design and sell products at the level of integration desired by a customer, from components to turn-key equipment, providing our customers a dependable, cost-effective and simplified supply chain.
- **Deliver high quality, reliable products in high volume.** As a vertically integrated supplier, we are able to monitor and maintain quality control throughout the production process, using our internally produced components, where possible, for our final products. With manufacturing facilities in the U.S., Taiwan and China, we can support high volume production and timely delivery for our customers around the world.
- **Provide sophisticated design solutions to our customers.** We believe our in-house expertise in both analog and digital optical engineering enables us to design comprehensive solutions that meet many of the different network architectures and protocols used by our customers.

Our Strengths

Our key competitive strengths include the following:

- **Proprietary technological expertise and track record of innovation.** We continue to develop innovative products by leveraging our technological expertise, including our proprietary MBE and MOCVD laser fabrication process.
- **Innovative light engine design and manufacturing.** High-speed data center interconnect transceivers increasingly rely on multiple parallel optical signals. Our expertise in designing and manufacturing light engines, which combine lasers and photodiodes, and in some cases, driver electronics and/or signal amplifiers, with channel multiplexing and de-multiplexing elements, gives us the ability to quickly develop new products for our data center customers.
- **Proven system design capabilities.** We have extensive expertise and proven design capabilities in high-speed optical, mixed-signal semiconductor and mechanical engineering, which we believe position us to take advantage of the continuing shift to outsourced design and manufacturing among CATV equipment vendors.
- **Industry-leading position in the CATV market.** We continue to be awarded new design and manufacturing opportunities for CATV components and equipment. We serve a majority of the largest CATV equipment manufacturers in the world and our knowledge of both their requirements and the needs of their customers (the CATV network operators) allows us to access these new opportunities.
- **Vertically integrated, geographically distributed manufacturing model.** Our vertically integrated design and manufacturing process encompasses various steps from laser design and fabrication to complete optical system design and assembly. Furthermore, we have geographically distributed our manufacturing by strategically locating our operations in the U.S., China and Taiwan to reduce development time and production costs, to better support our customers and to help protect our intellectual property.

Our Strategy

We seek to be the leading global provider of optical components, modules and equipment for each of our four target markets: CATV, internet data centers, CATV, telecom and FTTH. Our strategy includes the following key elements:

- **Extend our leadership in CATV networking.** We intend to maintain our position as a leading producer of optical components used in CATV networks, and to capture an increasing share of the CATV equipment market as the major equipment vendors continue to outsource the design and manufacturing of such products.
- **Continue to penetrate the internet data center market.** In the internet data center market, we primarily target internet data center operators who have adopted an open system architecture—one in which the optical connectivity solutions can be provided by a different vendor than the vendor which provides their servers and switches.
- **Extend our leadership in CATV networking.** We intend to add to our product portfolio in the CATV market following our recent launch of our own branded products to sell directly to MSOs, which we believe offers us further opportunity to enhance our presence as a supplier in the CATV market.
- **Continue to invest in our capabilities and infrastructure.** We intend to continue to invest in new products, new technology and our production infrastructure and facilities to maintain and strengthen our competitive position. We engage in an active research and development program to develop new products and enhance existing products.
- **Selectively pursue other opportunities that leverage our existing expertise.** Our expertise in designing and manufacturing outdoor equipment for the CATV industry positions us well to pursue applications that are also characterized by having varying and demanding environments, including wireless and wireline telecom infrastructure, industrial robotics, aerospace and defense, and oil and gas exploration.
- **Pursue complementary acquisition and strategic alliance opportunities.** We evaluate and selectively pursue acquisition opportunities or strategic alliances that we believe will enhance or complement our current product offerings, augment our technology roadmap, or diversify our revenue base.

Our Technology

We believe that we have technology leadership in four key areas: semiconductor laser manufacturing, electronic technologies that enhance the performance of our lasers, optical hybrid integration and mixed-signal semiconductor design.

- **Differentiated semiconductor laser manufacturing.** We use a combination of MBE and MOCVD processes in the fabrication of our lasers. We believe that the combination of these two epitaxial processes allows our products to benefit from the advantages afforded by each of these techniques. Among the differentiators of MBE relative to MOCVD fabrication are a lower process temperature and the use of solid phase materials rather than gaseous sources to grow wafers and the growth of more highly strained crystals. These factors contribute to longer operating lives of our lasers, improved laser efficiency and threshold current, and other performance attributes that make them well-suited to our target markets. While we believe that these advantages of MBE are important, MBE does have disadvantages including the inability to use certain dopant materials (for example, Iron), difficulty in certain types of regrowth, and the necessity to maintain complex ultra-high vacuum equipment. By utilizing MOCVD in a portion of our production process, we are able to ameliorate some of these disadvantages. However, the epitaxial and processing steps required in the fabrication of our devices are very complex, with numerous critical steps requiring highly precise control. As a result of some of these challenges, production yields and the performance attributes of laser devices are highly variable and optimizing these characteristics requires numerous enhancements and modifications to standard MBE equipment and the MBE process. To our knowledge, we are unique in incorporating MBE processes in the production of communications lasers in high volume, and believe it would be difficult and time-consuming for other vendors to replicate our production technology.
- **Laser enhancement technology.** Certain properties of the semiconductor lasers predominantly used in traditional communications devices, such as chirp and wavelength drift, negatively affect their ability to transmit signals over long fiber distances or prevent them from transmitting signals with acceptable fidelity in certain applications. We have developed laser enhancement circuitry that can correct many of these deficiencies. We believe that our technology will become more essential with wider deployment of higher capacity CATV and FTTH systems, which place more stringent demands on laser performance.

- **Optical hybrid-integration technology.** Reducing the size, power consumption and complexity of optical devices is essential for achieving the price and performance targets of our customers. Our ability to integrate multiple optical networking functions into a single device and to co-package multiple devices into smaller form factors helps us meet customer requirements, which we believe can also create new opportunities. For instance, the transmission speed between network elements (switches and servers, for example) within the data center has continued to increase. However, the rate at which this data can be converted from electrical signals to optical signals by laser diodes has not increased at the same pace. Therefore, to achieve data rates of 40 Gbps and above, many customers utilize multiple lower data rate lasers co-packaged together into a single optical module, which we refer to as a light engine. The technology required to cost-effectively and reliably co-package these lasers and the associated electronic control circuitry is complex. Our extensive experience with the processes and the manufacturing technologies required to produce these devices gives us a competitive advantage.

Similarly, in FTTH and telecom networks, installing new fiber-optic cable is expensive and difficult, and in some situations prohibitively so for a network service provider. As a consequence, network operators seek to maximize the utilization of their installed fiber plant. In long-haul and metropolitan networks, the number of service providers who deployed WDM technology as fiber utilization rose. Fiber utilization in access networks has risen, but the use of WDM technology in the access segment has been problematic due to the relatively high cost and power consumption of the requisite optical devices. We have developed proprietary miniaturized optical packaging, electronic control circuitry and testing algorithms to create a hybrid WDM-PON solution that addresses these historical impediments that we believe will make WDM-PON a cost-effective alternative for deployment.

- **Mixed-signal design.** As CATV providers continue to evolve from primarily broadcast-video content providers to a mixture of HD video content together with data-connectivity providers, the networks they utilize to offer these services must evolve as well. Older analog networks are giving way to hybrid networks that incorporate both analog and digital signals. For example, many newer networks are being designed with “digital return-path” capabilities, and certain MSOs have begun to deploy “Remote-PHY” technologies. Both of these technologies involve transporting certain network signals in digital format, and then converting these signals to and from analog signals at various points in the MSO's network. This combination of analog and digital signaling creates unique design challenges. Our engineers have many years of experience in developing equipment, modules and components that are well suited to these sorts of mixed-signal architectures. We believe that having deep experience in both digital and analog signaling allows us to offer superior solutions to our customers, compared with companies who have expertise in only one of these signal types.

Our Products

Our products include an array of optical communications solutions at varying levels of integration. We begin from the fundamental building blocks of lasers and laser components. From these foundational products, we design and manufacture a wide range of products from optical modules to complete turn-key equipment. We design our products to target customers in our identified markets to meet their needs and specifications.

Our components often incorporate one or more of our optical laser chips inside a precision housing that provides mechanical protection as well as standardized electrical contacts. More complex optical components may also include optical filters (for example, for use in WDM) or other optical elements by which optical signals are routed internally within the component. These more advanced components may also include coolers, heaters and sensors that allow the temperature of the laser chip to be measured and controlled. We manufacture the majority of the laser chips and optical components that are used in our own products.

At the next level of integration, our module or sub-assembly products typically contain one or more of our optical components and some additional control circuitry. Examples of modules include our transceiver line primarily used in internet data center markets, telecom markets, and FTTH markets.

At the highest level of integration and complexity, our equipment products typically contain one or more optical components, modules and additional electronic control circuitry required to enable these subsystems to operate independently. For example, our CATV transmitter equipment requires utilization of our optical components and assembly onto a circuit board and to an external housing. Examples of equipment include our CATV transmitter and CATV nodes.

Research and Development

To maintain our growth and competitiveness, we engage in an active research and development program to develop new products and enhance existing products. As a result of these efforts, we anticipate releasing various new or enhanced products over the next several years.

As of December 31, 2022 2023, we had a total of 217 233 employees working in the R&D department, including seven nine with Ph.D. degrees. We continue to recruit talented engineers to further enhance our research and development capabilities. We have research and development departments in our facilities in Texas, Georgia, China and Taiwan. Our research and development teams collaborate on joint projects, and by co-locating with our manufacturing operations enable us to achieve an efficient cost structure and improve our time to market.

A key factor in our research and development success is our highly collaborative process for new product development. Particularly in our equipment and module businesses, we often collaborate very closely with our customers from a very early stage in product development. By purposefully fostering this close collaboration, we believe that we can more rapidly develop leading solutions meeting the needs of our customers.

Intellectual Property

We rely on a combination of patent, copyright, trademark, trade secret laws and unfair competition laws, as well as confidentiality and licensing arrangements, to establish and protect our intellectual property. We employ various methods to protect these intellectual property rights, including maintaining a technological infrastructure with significant security measures, limiting disclosure and restricting access to only those individuals with an operational need for such information, and having employees, consultants and suppliers execute confidentiality agreements with us. While we expect our intellectual property to provide competitive advantages, we also find meaningful value from unpatented proprietary process knowledge, know-how and trade secrets.

Patents

As of December 31, 2022 2023, we owned a total of 165 176 U.S. issued patents and 130 150 patents issued in China and Taiwan, plus a number of pending U.S. and foreign/international patent applications. Our issued U.S. and foreign patents will expire between 2023 2024 and 2042 2043. While our patents are an important element of our success, our business as a whole is not dependent on any one patent or group of patents. We do not anticipate any material effect on our business due to any patents expiring in 2023, 2024, and we continue to obtain new patents through our ongoing research and development.

Our portfolio of patents and patent applications covers several different technology families including:

- laser structure and design;
- optical signal conditioning and laser control;
- laser fabrication;
- photodiode and optical receiver design and fabrication;
- optical device and module designs;
- optical device packaging equipment and techniques; and
- optical network enhancements, enhancements; and

■ CATV networking technologies.

Trademarks

We have registered the trademarks APPLIED OPTOELECTRONICS, INC., AOI, and our logo we have filed for registration of trademark for Quantum Bandwidth with the U.S. Patent and Trademark Office on the Principal Register. These marks are also registered in, or have applications for registration pending in, various foreign trademark offices.

Manufacturing and Operations

We have three manufacturing sites: Sugar Land, Texas, Ningbo, China and Taipei, Taiwan. Our research and development functions are generally partnered with our manufacturing locations, and we have an additional research and development facility in Duluth, Georgia. In our Sugar Land facility, we manufacture laser chips (utilizing our MBE and MOCVD processes), subassemblies and components. The subassemblies are used in the manufacture of components by our other manufacturing facilities or sold to third parties as modules. We manufacture our laser chips only within our Sugar Land facility, where our laser design team is located. In our Taiwan location, we manufacture optical components, such as our butterfly lasers, which incorporate laser chips, subassemblies and components manufactured within our Sugar Land facility. In addition, in our Taiwan location, we manufacture transceivers for the internet data center, telecom, FTTH and other markets. In our China facility, we take advantage of lower labor costs and manufacture certain more labor intensive components and optical equipment systems, such as optical subassemblies and transceivers for the CATV transmitters (at the headend), internet data center market, and CATV outdoor equipment (at the node). Each manufacturing facility conducts testing on the components, modules or subsystems it manufactures and each facility is certified to ISO 9001:2015 and ISO 14001:2015.

We sell our products to customers worldwide, and in addition to these external customer sales many of our products are used internally in the production of transceivers and equipment that we manufacture. With a vertically integrated manufacturing process, we produce many of our own laser chips and other parts required to manufacture our optical components. Through this model, we are able to reduce development time and product costs as well as actively monitor and control product quality. We incorporate our own

components into our transceivers, subsystems and equipment products wherever possible. In instances where we do not produce components ourselves, we source them from external suppliers and regularly evaluate these relationships in an attempt to reduce risk and lower cost.

We depend on a limited number of suppliers, including in some cases our own internal supply, for certain raw materials and components used in our products. We regularly review our vendor relationships in an attempt to mitigate risks and lower costs, especially where we depend on one or two vendors for critical components or raw materials. While maintaining inventories that we believe are sufficient to meet our near-term needs, we strive not to carry significant inventories of externally sourced raw materials. Accordingly, we maintain ongoing communications with our vendors in order to help prevent any interruptions in supply, and have implemented a supply-chain management program to maintain quality and lower purchase prices through standardized purchasing efficiencies and design requirements.

Sources of Raw Materials

We depend on a limited number of suppliers for certain raw materials, components, and equipment used in our products. We continually review our supplier relationships to mitigate risks and lower costs, especially where we depend on one or two suppliers for critical components or raw materials. While maintaining inventories that we believe are sufficient to meet our near-term needs, we strive not to carry significant inventories of raw materials. Accordingly, we maintain ongoing communications with our suppliers in order to prevent any interruptions in supply, and have implemented a supply-chain management program to maintain quality and lower purchase prices through standardized purchasing efficiencies and design requirements. To date, we generally have been able to obtain sufficient quantities of critical supplies in a timely manner.

We are subject to rules promulgated by the SEC pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act regarding the use of "conflict minerals". These rules have imposed and will continue to impose additional costs and may introduce new risks related to our ability to verify the origin of any "conflict minerals" used in our products.

Customers

Our customers are primarily CATV, internet data center operators, CATV, telecom equipment manufacturers, and internet service providers. We generally employ a direct sales model in North America and in the rest of the world we use both direct and indirect sales channels. In 2023, 2022, 2021 and 2020, we obtained 99.6%, 98.6%, 98.01%, 99.6%, and 97.6%, 98.01% of our revenue, respectively, through our direct sales efforts and the remainder of our revenue through our indirect sales channels. Our sales channel partners provide logistical services and day-to-day customer support. Where we sell through an indirect sales channel, we work with the end customer to establish technological specifications for our products. Our equipment customers typically offer our equipment under their brand-name and our equipment is often customized with unique design or performance criteria by each of these customers. We also from time to time offer design or manufacturing services to customers to assist them in more effectively using our products and realizing time-to-market advantages.

In the last four years, we have taken several actions to increase the diversity of our customer base. These actions include hiring sales staff to improve our ability to serve new customers and the introduction of new products that we believe will appeal to new customers. Furthermore, we have developed additional original design manufacturer, or ODM, relationships with customers in each of our target markets which should enable us to diversify our revenue base.

In 2022, 2023, our three large CATV original equipment manufacturers, or OEMs, consisted of ATX, Cisco and CommScope. The three customers who contributed most to our data center revenue were Microsoft, a U.S. based large datacenter data center operator and a China based manufacturer. In 2023, our three largest CATV customers were ATX, Digicom and a U.S. based NEM, large CATV equipment provider. In 2022, 2023, revenue from the CATV market, internet data center market, CATV market, telecom market, FTTH market and other markets provided 53.0%, 64.9%, 34.6%, 27.5%, 11.1%, 6.4%, 0.1%, 0.0% and 1.2% of our revenue, respectively, compared to 44.6%, 34.6%, 46.1%, 53%, 7.7%, 11.1%, 0.5%, 0.1% and 1.1%, 1.2%, respectively, in 2021, 2022.

In our telecom market, we manufacture and sell optical products which include transceivers designed to transmit signals used in 5th Generation ("5G") mobile networks, and various products targeted at the metro-scale telecom networking market. We have various other products designed for diverse applications, both inside and outside of communications technology, which generally are derivatives of products developed for our four target markets.

We support our sales efforts by attendance at industry trade shows (virtually and in person), technical conferences and other promotional efforts. These efforts are aimed at attracting new customers and enhancing our existing customer relationships.

Backlog

We generally make sales pursuant to short-term purchase orders without deposits and subject to rescheduling, revision or cancellation on short notice. We accordingly believe that purchase orders are not an accurate indicator of our future sales and any backlog of purchase orders is not a reliable indicator of our future revenue.

Competition

The optical networking market is intensely competitive. Because of the broad nature of our product offerings, we do not believe that we face a single major competitor across all of our markets. We do, however, experience intense competition in each product area from a number of manufacturers and we anticipate that competition will increase. Our major competitors in one or more of our markets include EMCORE Corporation, Finisar Corporation who was acquired by II-VI Incorporated, Foxconn Interconnect Technology Ltd., InnoLight Technology (Suzhou) Ltd., Intel Corporation, Lumentum Holdings, Inc., Mitsubishi, Molex, LLC, Source Photonics, Inc. and Sumitomo Electric Industries, Ltd.

Many of our competitors are larger than we are and have significantly greater financial, marketing and other resources.

In addition, several of our competitors have large market capitalizations or cash reserves and are much better positioned to acquire other companies to gain new technologies or products that may displace our products. Network equipment providers, who are our customers, and network service providers, who are supplied by our customers, may decide to manufacture the optical subsystems incorporated into their network systems in-house. We also encounter potential customers that, because of existing relationships, are committed to the products offered by these competitors.

We believe the principal competitive factors in our target markets include the following:

- use of internally manufactured components;
- product breadth and functionality;
- timing and pace of new product development;
- breadth of customer base;
- technological expertise;
- reliability of products;
- product pricing; and
- manufacturing efficiency.

We believe that we compete favorably with respect to the above factors based on our MBE and MOCVD processes, our vertically integrated model, the performance and reliability of our product offerings, and our technical expertise in light engine design and manufacture.

Seasonality

See Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations—Seasonality," regarding seasonality of certain of the Company's products.

Human Capital

Employees

As of December 31, 2022 2023, we employed 2,213 2,149 full-time employees, of which 35 37 held Ph.D. degrees in a science or engineering field. Of our employees, 301 330 are located in the U.S., 449 464 are located in Taiwan and 1,463 1,355 are located in China.

As of December 31, 2022 2023, none of our employees are represented by any collective bargaining agreement, but certain employees of our China subsidiary are members of a trade union. We have never suffered any work stoppage as a result of an employment related strike or any employee related dispute and believe that we have satisfactory relations with our employees.

Employee Engagement, Development and Career Planning

Our business results depend in part on our ability to successfully manage our human capital resources, including attracting, identifying, and retaining key talent. Factors that may affect our ability to attract and retain qualified employees include employee morale, our reputation, competition from other employers, and availability of qualified individuals. We believe our commitment to our human capital resources is an important component of our mission to deliver superior products to our customers. We provide all employees with the opportunity to share their opinions in open dialogues with our human resources department and senior management. In the past, we have conducted confidential surveys of select workforce members to measure engagement. The results are discussed with senior leadership and managers. We provide all employees a wide range of professional development experiences, both formal and informal. We offer our highest level employees/executives/VPs leadership development programs as part of our talent and succession planning process. Also, we have development programs for managers and supervisors and learning opportunities for all employees. We provide access to learning platforms so employees can access resources to support their career aspirations and advance their skills.

Employee Safety

The safety of our employees is a paramount value for us. We provide mandatory safety trainings in our production facilities, which are designed to focus on empowering our employees with the knowledge and tools they need to make safe choices and to mitigate risks. Supervisors complete safety management courses as well. In response to the COVID-19 pandemic, we implemented significant changes that we determined were in the best interest of our employees and which comply with government orders in all the states and countries where we operate. In an effort to keep our employees safe and to maintain operations during the COVID-19 pandemic, we have implemented a number of new health-related measures including, the requirement to wear company provided face-masks at all times while on company property, implemented temperature taking protocols, increased hygiene, cleaning and sanitizing procedures at all Company sites, implemented social-distancing, implemented restrictions on visitors to our facilities, limiting in-person meetings and other gatherings.

Compensation, Benefits and Wellness

We offer fair, competitive compensation and benefits that support our employees' overall wellness. Further, the health and wellness of our employees are critical to our success. We provide our employees with access to a variety of innovative, flexible and convenient health and wellness programs. Such programs are designed to support employees' physical and mental health by providing tools and resources to help them improve or maintain their health status and encourage engagement in healthy behaviors. We offer financial education and financial wellness tools and resources to help employees reach their personal financial goals. Additionally, we provide robust compensation and benefits through internal and external benchmarking.

Governmental Regulations

Our research and development and manufacturing operations and our products are subject to a variety of federal, state, local and foreign environmental, health and safety laws and regulations, including those governing discharges of pollutants to air and water, the use, storage, handling and disposal of hazardous materials and solid wastes, employee health and safety, and the hazardous material content in our products. To date, costs and accruals incurred to comply with these governmental regulations have not been material to our capital expenditures, results of operations, and competitive position. Our environmental management systems in our facilities in Sugar Land, Texas, Ningbo, China and Taipei, Taiwan are all certified to meet the requirements of ISO14001:2015. However, there can be no assurance that violations of applicable laws at any of our facilities will not occur in the future as a result of human error, accident, equipment failure or other causes. We use, store and dispose of hazardous materials and solid wastes in our manufacturing operations and hazardous materials are present in our products. We incur costs to comply with environmental, health and safety requirements, and any failure to comply, or the identification of contamination for which we are found liable, could cause us to incur substantial costs, including cleanup costs, natural resource damages, monetary fines, or administrative, civil or criminal penalties, and subject us to property damage and personal injury claims, and result in injunctive relief including the suspension of production, alteration or upgrades of our manufacturing processes, redesign of our products, or curtailment of sales, and could result in adverse publicity. Liability under environmental, health and safety laws can be joint and several and without regard to fault or negligence. For example, pursuant to environmental laws and regulations, including but not limited to the Comprehensive Environmental Response Compensation and Liability Act, or CERCLA, we may be liable for the full amount of any remediation-related costs at properties we currently own or operate or formerly owned, such as our currently owned Sugar Land, Texas facility, or at properties at which we previously operated, as well as at properties we will own or operate in the future, and properties to which we have sent hazardous substances, whether or not we caused the contamination.

Environment

We are committed to maintaining compliance with all environmental laws applicable to our operations, products, and services and to reducing our environmental impact across our business. Our operations and many of our products are subject to various federal, state, local, and foreign regulations that have been adopted with respect to the environment, such as the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment; Registration, Evaluation, Authorization, and Restriction of Chemicals; and Substances of Concern In Products, regulations adopted by the European Union, or EU.

Over and above our commitment to compliance with all environmental laws, we have further committed ourselves to the following environment goals:

- Obtain at least 20% of the energy used in our operations from renewable sources

- Properly recycle waste materials including paper, electronic components, glass and batteries
- Reduce our generation of hazardous waste by at least 10% over the five year period beginning in 2021

In order to meet these goals, we maintain an Integrated Environmental and Safety Management System.

We expect that our operations and products will be affected by new environmental requirements on an ongoing basis. Environmental, health and safety requirements have become more stringent over time, and changes to existing requirements could restrict our ability to expand our facilities, require us to acquire costly pollution control equipment, require us to obtain additional permits for our activities, or cause us to incur other significant expenses or to modify our manufacturing processes or the hazardous material content of our products. Identification of presently unidentified environmental conditions, more vigorous enforcement by a governmental authority, enactment of more stringent legal requirements or other unanticipated events could give rise to adverse publicity, restrict our operations, affect the design or marketability of our products or otherwise cause us to incur material environmental costs or delays in planned activities.

We face increasing complexity in our product design and procurement operations as we adjust to new and upcoming requirements relating to the materials composition of our products. Some jurisdictions in which our products are sold have enacted requirements regarding the hazardous material content of certain products. For example, member states of the European Union and China are among a growing number of jurisdictions that have placed restrictions on the use of lead, among other chemicals, in electronic products, which affect the composition and packaging of our products. The passage of such requirements in additional jurisdictions, or the tightening of standards or elimination of certain exemptions in jurisdictions where our products are already subject to such requirements, could cause us to incur significant expenditures to make our products compliant with new requirements, or could limit the markets into which we may sell our products. Other governmental regulations may require us to reengineer our products to use components that are more environmentally compatible, resulting in additional costs to us.

Climate Change and Sustainability

We are spreading initiatives that aim to drive sustainability and reduce our environmental impact. In addition, we continue to focus on the efficiency of our technology, including but not limited to using light sensors and dimming technology that control brightness and exploring alternative energy sources.

Export Controls

The Bureau of Industry and Security (BIS) of the U.S. Department of Commerce is responsible for regulating the export of most commercial items that are classified as dual-use goods that may have both commercial and military applications. Our products are primarily classified under Export Control Classification Numbers or ECCNs, (ECCN) 5A991, 6A995, and 6A995, EAR99. Export Control Classification requirements are dependent upon an item's technical characteristics, the destination, the end-use, and the end-user, and other the activities of the end-user. Should the ECCN change, then the export of our products to certain countries would be restricted. However, we currently do not export our products to any countries on the restricted list, and therefore a change in the ECCN would not materially impact our business.

Additional information concerning regulatory compliance and a discussion of the risks associated with governmental regulations that may materially impact us is described more fully under the heading "Risk Factors" in this Form 10-K.

Corporate Information

We were incorporated in the State of Texas in 1997. In March 2013, Applied Optoelectronics, Inc., a Texas corporation, converted into a Delaware corporation. Prime World International Holdings, Ltd. ("Prime World") is a wholly-owned subsidiary of the Company incorporated in the British Virgin Islands on January 13, 2006. Prime World is the parent company of Global Technology, Inc. ("Global"). Global was established in June 2002 in the People's Republic of China ("PRC") and was acquired by Prime World on March 30, 2006. Prime World also operates a division in Taiwan, which is qualified to do business in Taiwan and primarily manufactures transceivers and performs research and development activities.

Our principal executive offices are located at 13139 Jess Pirtle Blvd., Sugar Land, TX 77478, and our telephone number is (281) 295-1800. Our website address is www.ao-inc.com. Information contained on our website is not incorporated by reference into this Form 10-K.

Available Information

We file electronically with the United States Securities and Exchange Commission, or SEC, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended. We make available on our website at www.ao-inc.com free of charge, copies of these reports as soon as reasonably practicable after filing these reports with, or furnishing them to, the SEC.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. You should carefully consider the following risk factors and all other information contained in our Form 10-K, including our consolidated financial statements and related notes. If any of the following risks actually occur, we may be unable to conduct our business as currently planned and our financial condition and results of operations could be seriously harmed. In addition, the trading price of our common stock could decline due to the occurrence of any of these risks and you may lose all or part of your investment.

Risks Related to Our Divestiture in the PRC

The announcement and pendency of our proposed sale of our China manufacturing facilities could materially adversely affect our business, financial condition, and results of operations.

On September 15, 2022, AOI and Prime World International Holdings Ltd. (the "Seller"), which is a company incorporated in the British Virgin Islands and wholly owned subsidiary of AOI, entered into a definitive agreement (the "Purchase Agreement") with Yuhao Optoelectronic Technology (Shanghai) Co., Ltd. (the "Purchaser"), which is a company incorporated in the PRC, under which AOI would divest its manufacturing facilities located in the PRC and certain assets related to its transceiver business and multichannel optical sub-assembly products for the internet data center, FTTH and telecom markets (collectively, "the Divestiture"). The purchase price payable by the Purchaser to the Seller will be an amount equal to the \$150 million USD equivalent of Renminbi, less a holdback amount. Prior to the closing of this transaction, AOI anticipates investing an amount equal to between 4% and 10% of the estimated proceeds from the transaction in exchange for a 10% equity interest in the Purchaser. Both transactions are expected to close in 2023, subject to customary closing conditions and regulatory approval.

The announcement and pendency of our proposed divestiture could disrupt our business and create uncertainty about our future, which could have a material and negative impact on our business, financial condition, and results of operations, regardless of whether the divestiture is completed. These risks to our business, all of which could be exacerbated by any delay in the closing of the divestiture, include:

- restrictions in the Purchase Agreement on the conduct of our business prior to the closing of the divestiture, which prevent us from taking specified actions without the prior consent of Purchaser, which actions we might otherwise take in the absence of the Purchase Agreement;
- the attention of our management may be directed towards the closing of the divestiture and may be diverted from our day-to-day business operations, and matters related to the divestiture may require commitments of time and resources that could otherwise have been devoted to other opportunities that might have been beneficial to us;
- our customers, suppliers other parties may decide not to renew or seek to terminate, change or renegotiate their relationship with us, whether pursuant to the terms of their existing agreements with us or otherwise;
- our employees may experience uncertainty regarding their future roles, which might adversely affect our ability to retain, recruit and motivate key personnel; and
- potential litigation relating to the divestiture and the related costs.

Any of these matters could adversely affect our stock price, business, financial condition, results of operations, or business prospects. In addition, divestiture of our manufacturing facilities in the PRC also contain inherent risks that may impact our ability to fully realize the benefits of such divestiture, including possible delays in closing and potential post-closing claims for indemnification. The divestiture may also have a dilutive impact on our future earnings if we are unable to offset the dilutive impact from the loss of revenue associated with the divestiture, as well as significant write-offs, including those related to goodwill and other intangible assets. If any of these risks materialize, the benefits of such divestiture may not be fully realized, if at all, and our business, financial condition, and results of operations could be negatively impacted.

The parties may be unable to satisfy the conditions to the closing of our divestiture and the transaction may not be consummated, and the failure of the Divestiture to be completed may adversely affect our business and our common stock price.

Consummation of our divestiture of our China manufacturing facilities is subject to various closing conditions, including, among other things, approval from the Committee on Foreign Investment in the United States (CFIUS) and other regulatory approvals. CFIUS has been increasingly relied upon in recent years as a tool to prevent foreign investment that poses a national security risk, often focused on either Chinese or Russian buyers. Although we do not believe the proposed divestiture presents a national security risk, CFIUS has been directed to focus on transactions that could give foreign parties access to U.S. technologies, data, or critical supply chains. Closing conditions related to regulatory approval and other conditions to the consummation of the proposed divestiture may fail to be satisfied. In addition, satisfying the conditions to the divestiture may take longer than we and the Purchaser currently expect. The satisfaction of all of the required conditions could delay the completion of the divestiture for a significant period of time or prevent it from occurring. Thus, there can be no assurance that the conditions to the divestiture will be satisfied or waived or that the divestiture will be consummated.

In addition, the Purchase Agreement may be terminated under specified circumstances. Failure to complete the divestiture could adversely affect our business and the market price of our common stock in a number of ways, including:

- our current stock price may reflect a market assumption that the proposed acquisition will occur, meaning that a failure to complete the proposed transaction could result in a decline in the price of our common stock;
- we may be subject to legal proceedings related to the divestiture;
- the failure of the divestiture to be consummated may result in negative publicity and a negative impression of us in the investment community;
- any disruptions to our business resulting from the announcement and pendency of the divestiture, including any adverse changes in our relationships with our customers, vendors and employees, may continue or intensify in the event the divestiture is not consummated;
- we may not be able to take advantage of alternative business opportunities or effectively respond to competitive pressures;
- we may be required to pay a termination fee of approximately \$3 million if the Purchase Agreement is terminated under certain circumstances;
- we expect to incur substantial transaction costs in connection with the proposed transaction, whether or not it is completed; and

we may not be entitled to receive a termination payment from Purchaser in all circumstances where the Purchase Agreement is terminated due to Purchaser's breach of its obligations under the Purchase Agreement or where we fail to obtain CFUIUS approval.

Risks Related to Operating Our Business

We are dependent on our key customers for a significant portion of our revenue and the loss of, or a significant reduction in orders from, any of our key customers would adversely impact our revenue and results of operations.

We generate much of our revenue from a limited number of customers. For each year ended 2023, 2022, 2021 and 2020, our top ten customers represented 87.2%, 92.7%, 84.7%, 87.2%, and 84.3%, 84.7% of our revenue, respectively. In 2022, 2023, ATX Microsoft represented 47.3%, 46.6% of our revenue, Microsoft ATX represented 18.4%, 15.6% of our revenue, and a US based large datacenter operator Digicomm represented 5.9%, 11.3% of our revenue. As a result, the loss of, or a significant reduction in orders from any of our key customers would materially and adversely affect our revenue and results of operations. We typically do not have long-term contracts with our customers and instead rely on recurring purchase orders. However, many of our current revenue expectations and forecasts reflect significant anticipated orders from a limited number of key customers. If our key customers do not continue to purchase our existing products or fail to purchase additional products from us, our revenue would decline and our results of operations would be adversely affected.

Adverse events affecting our key customers could also negatively affect our ability to retain their business and obtain new purchase orders, which could adversely affect our revenue and results of operations. For example, in recent years, there has been consolidation among various network equipment manufacturers and this trend is expected to continue. We are unable to predict the impact that industry consolidation would have on our existing or potential customers. We may not be able to offset any potential decline in revenue arising from the consolidation of our existing customers with revenue from new customers or additional revenue from the merged company.

Customer demand is difficult to forecast accurately and, as a result, we may be unable to match production with customer demand.

We make planning and spending decisions, including determining the levels of business that we will seek and accept, production schedules, component procurement commitments, personnel needs and other resource requirements, based on our estimates of product demand and customer requirements. Our products are typically purchased pursuant to individual purchase orders. While our customers may provide us with their demand forecasts, they are typically not contractually committed to buy any quantity of products beyond firm purchase orders. Furthermore, many of our customers may increase, decrease, cancel or delay purchase orders already in place without significant penalty. The short-term nature of commitments by our customers and the possibility of unexpected changes in demand for their products reduce our ability to accurately estimate future customer requirements. On occasion, customers may require rapid increases in production, which can strain our resources, cause our manufacturing to be negatively impacted by materials shortages, necessitate more onerous procurement commitments and reduce our gross margin. We may not have sufficient capacity at any given time to meet the volume demands of our customers, or one or more of our suppliers may not have sufficient capacity at any given time to meet our volume demands. If any of our major customers decrease, stop or delay purchasing our products for any reason, we will likely have excess manufacturing capacity or inventory and our business and results of operations would be harmed.

If our customers do not qualify our products for use on a timely basis, our results of operations may suffer.

Prior to the sale of new products, our customers typically require us to "qualify" our products for use in their applications. At the successful completion of this qualification process, we refer to the resulting sales opportunity as a "design win." Additionally, new customers often audit our manufacturing facilities and perform other evaluations during this qualification process. The qualification process involves product sampling and reliability testing and collaboration with our product management and engineering teams in the design and manufacturing stages. If we are unable to accurately predict the amount of time required to qualify our products with customers, or are unable to qualify our products with certain customers at all, then our ability to generate revenue could be delayed or our revenue would be lower than expected and we may not be able to recover the costs associated with the qualification process or with our product development efforts, which would have an adverse effect on our results of operations.

In addition, due to rapid technological changes in our markets, a customer may cancel or modify a design project before we have qualified our product or begun volume manufacturing of a qualified product. It is unlikely that we would be able to recover the expenses for cancelled or unutilized custom design projects. Some of these unrecoverable expenses for cancelled or unutilized custom design projects may be significant. It is difficult to predict with any certainty whether our customers will delay or terminate product qualification or the frequency with which customers will cancel or modify their projects, but any such delay, cancellation or modification would have a negative effect on our results of operations.

Our ability to successfully qualify and scale capacity for new technologies and products is important to our ability to grow our business and market presence, and we may invest a significant amount to scale our capacity to meet potential demand from customers for our new technologies and products. If we are unable to qualify and sell any of our new products in volume, on time, or at all, our results of operations may be adversely affected.

Technology adoption cycles impact our business.

In each of our markets, technology standards influence customer purchasing patterns and vendor selection. Network operators deploy the next generation of technology at different times, and typically reduce or stop their purchase of the trailing generation of equipment in advance of their deployment of the next generation. Our revenue from sales of

the trailing generation products may fall rapidly, or at an uneven rate, and the prices at which we can sell the trailing generation products may decline. If we do not effectively manage our inventory, we may have an excess of inventory that we may not be able to participate in vendor selection processes of operators and their equipment providers for the next generation of technology deployment, which would reduce our future revenue potential.

We must continually develop successful new products and enhance existing products, and if we fail to do so or if our release of new or enhanced products is delayed, our business may be harmed.

The markets for our products are characterized by frequent new product introductions, changes in customer requirements and evolving industry standards, all with an underlying pressure to reduce cost and meet stringent reliability and qualification requirements. Our future performance will depend on our successful development, introduction and market acceptance of new and enhanced products that address these challenges. If we are unable to make our new or enhanced products commercially available on a timely basis, we may lose existing and potential customers and our financial results would suffer.

In addition, due to the costs and length of research, development and manufacturing process cycles, we may not recognize revenue from new products until long after such expenditures, if at all, and our margins may decrease if our costs are higher than expected, adversely affecting our financial condition and results of operations.

Although the length of our product development cycle varies widely by product and customer, it may take 18 months or longer before we receive our first order. As a result, we may incur significant expenses long before customers accept and purchase our products.

Product development delays may result from numerous factors, including:

- modification of product specifications and customer requirements;
- unanticipated engineering complexities;
- difficulties in reallocating engineering resources and overcoming resource limitations; and
- rapidly changing technology or competitive product requirements.

The introduction of new products by us or our competitors and other changes in our customer's demands could result in a slowdown in demand for our existing products and could result in a write-down in the value of our inventory. We have in the past experienced periodic fluctuations in demand for existing products and delays in new product development, and such fluctuations will likely occur in the future. To the extent we fail to qualify our products and obtain their approval for use, which we refer to as a design win, or experience product development delays for any reason, our competitive position would be adversely affected and our ability to grow our revenue would be impaired.

Furthermore, our ability to enter a market with new products in a timely manner can be critical to our success because it is difficult to displace an existing supplier for a particular type of product once a customer has chosen a supplier, even if a later-to-market product provides better performance or cost efficiency.

The development of new, technologically advanced products is a complex and uncertain process requiring frequent innovation, highly-skilled engineering and development personnel and significant capital, as well as the accurate anticipation of technological and market trends. We cannot assure you that we will be able to identify, develop, manufacture, market or support new or enhanced products successfully or on a timely basis. Further, we cannot assure you that our new products will gain market acceptance or that we will be able to respond effectively to product introductions by competitors, technological changes or emerging industry standards. We also may not be able to develop the underlying core technologies necessary to create new products and enhancements, license these technologies from third parties, or remain competitive in our markets.

Our revenues, growth rates and operating results are likely to fluctuate significantly as a result of factors that are outside our control, which could adversely impact our operating results.

Our revenues, growth rates and operating results are likely to fluctuate significantly in the future as a result of factors that are outside our control. We may not achieve similar revenues, growth rates or operating results in future periods. Our revenues, growth rates and operating results for any prior quarterly or annual period should not be relied upon as any indication of our future revenues, growth rates or operating results. The timing of order placement, size of orders and satisfaction of contractual customer acceptance criteria, changes in the pricing of our products due to competitive pressures as well as order or shipment delays or deferrals, with respect to our products, may cause material fluctuations in revenues. Our lengthy sales cycle, which may extend to more than one year, may cause our revenues and operating results to vary from period to period and it may be difficult to predict the timing and amount of any variation. Delays or deferrals in purchasing decisions by our customers may increase as we develop new or enhanced products for existing and new markets, including automotive and biotechnology markets. Our current and anticipated future dependence on a small number of customers increases the revenue impact of each such customer's decision to delay or defer purchases from us, or decision not to purchase products from us. Our expense levels in the future will be based,

in large part, on our expectations regarding future revenue sources and, as a result, operating results for any quarterly period in which anticipated material orders fail to occur, or are delayed or deferred, could be significantly harmed.

If we encounter manufacturing problems, we may lose sales and damage our customer relationships.

We may experience delays, disruptions or quality control problems in our manufacturing operations. These and other factors may cause less than acceptable yields at our facility. Manufacturing yields depend on a number of factors, including the quality of available raw materials, the degradation or change in equipment calibration and the rate and timing of the introduction of new products. Changes in manufacturing processes required as a result of changes in product specifications, changing customer needs and the introduction of new product lines may significantly reduce our manufacturing yields, resulting in low or negative margins on those products. In addition, we use our MBE, fabrication process to make our lasers, in addition to MOCVD, the technique most commonly used in optical manufacturing by communications optics vendors, and our MBE fabrication process relies on custom-manufactured equipment. If our MBE or MOCVD fabrication facility in Sugar Land, Texas were to be damaged or destroyed for any reason, our manufacturing process would be severely disrupted. Any such manufacturing problems would likely delay product shipments to our customers. We may also experience delays in production, typically in February, during the Lunar New Year holiday when our facilities in China and Taiwan are closed.

Given the high fixed costs associated with our vertically integrated business, a reduction in demand for our products will likely adversely impact our gross profits and our results of operations.

We have a high fixed cost base due to our vertically integrated business model, including the fact that 1,851 1,772 of our employees as of December 31, 2022 2023 were employed in manufacturing and research and development operations. We may not be able to adjust these fixed costs quickly to adapt to rapidly changing market conditions. Our gross profit and gross margin are greatly affected by our sales volume and volatility on a quarterly basis and the corresponding absorption of fixed manufacturing overhead expenses. In addition, because we are a vertically integrated manufacturer, insufficient demand for our products may subject us to the risk of high inventory carrying costs and increased inventory obsolescence. Given our vertical integration, the rate at which we turn inventory has historically been low when compared to our cost of sales. We do not expect this to change significantly in the future and believe that we will have to maintain a relatively high level of inventory compared to our cost of sales. As a result, we continue to expect to have a significant amount of working capital invested in inventory. We may be required to write down inventory costs in the future and our high inventory costs may have an adverse effect on our gross profits and our results of operations.

Increasing costs and shifts in product mix may adversely impact our gross margins.

Our gross margins on individual products and among products fluctuate over each product's life cycle. Our overall gross margins have fluctuated from period to period as a result of shifts in product mix, the introduction of new products, decreases in average selling prices and our ability to reduce product costs, and these fluctuations are expected to continue in the future. We may not be able to accurately predict our product mix from period to period, and as a result we may not be able to forecast accurately our overall gross margins. The rate of increase in our costs and expenses may exceed the rate of increase in our revenue, either of which would materially and adversely affect our business, our results of operations and our financial condition.

Our financial results may vary significantly from quarter-to-quarter due to a number of factors, which may lead to volatility in our stock price.

Our quarterly revenue and operating results have varied in the past and will likely continue to vary significantly from quarter-to-quarter. This variability may lead to volatility in our stock price as research analysts and investors respond to these quarterly fluctuations. These fluctuations are due to numerous factors, including:

- the timing, size and mix of sales of our products;
- fluctuations in demand for our products, including the increase, decrease, rescheduling or cancellation of significant customer orders;
- our ability to design, manufacture and deliver products which meet customer requirements in a timely and cost-effective manner;
- the gain or loss of key customers;
- changes in our pricing and sales policies or the pricing and sales policies of our competitors;
- seasonality of certain of our products and manufacturing capabilities;
- quality control or yield problems in our manufacturing operations;
- supply disruption for certain raw materials and components used in our products;

- capacity constraints of our outside contract manufacturers for a portion of the manufacturing process for some of our products;
- length and variability of the sales cycles of our products;
- unanticipated increases in costs or expenses, including rising inflation or other changes in macroeconomic conditions;
- the loss of key employees;
- different capital expenditure and budget cycles for our customers, affecting the timing of their spending for our products;
- political stability in the areas of the world in which we operate;
- changes in or limitations imposed by trade protection laws or other regulatory orders or requirements in the United States or in other countries, including tariffs, sanctions, or other costs, restrictions, or requirements which may affect our ability to import or export our products to or from various countries; and
- trade-related government actions that impose barriers or restrictions that would impact our ability to sell or ship products to Huawei or other customers.

The foregoing factors are difficult to forecast, and these, as well as other factors, could materially adversely affect our quarterly and annual operating results. In addition, a significant amount of our operating expenses are relatively fixed in nature due to our internal manufacturing, research and development, sales and general administrative efforts. Any failure to adjust spending quickly enough to compensate for a revenue shortfall could magnify the adverse impact of such revenue shortfall on our results of operations. For these reasons, you should not rely on quarter-to-quarter comparisons of our results of operations as an indicator of future performance. Moreover, our operating results may not meet our announced guidance or the expectations of research analysts or investors, in which case the price of our common stock could decrease significantly. There can be no assurance that we will be able to successfully address these risks.

We depend on key personnel to develop and maintain our technology and manage our business in a rapidly changing market.

The continued services of our executive officers and other key engineering, sales, marketing, manufacturing and support personnel is essential to our success. For example, our ability to achieve new design wins depends upon the experience and expertise of our engineers. Any of our key employees, including our Chief Executive Officer, Chief Financial Officer, Senior Vice President and North America General Manager and Senior Vice President and Asia General Manager, may resign at any time. We do not have key person life insurance policies covering any of our employees.

To implement our business plan, we also intend to hire additional employees in expanding areas of our business. Our ability to continue to attract and retain highly skilled employees is a critical factor in our success. Competition for highly skilled personnel is intense. We may not be successful in attracting, assimilating or retaining qualified personnel to satisfy our current or future needs. Our ability to develop, manufacture and sell our products, and thus our financial condition and results of operations, would be adversely affected if we are unable to retain existing personnel or hire additional qualified personnel.

We depend on a limited number of suppliers and any supply interruption could have an adverse effect on our business.

We depend on a limited number of suppliers for certain raw materials and components used in our products. Some of these suppliers could disrupt our business if they stop, decrease or delay shipments or if the materials or components they ship have quality or reliability issues. Some of the raw materials and components we use in our products are available only from a sole source or have been qualified only from a single supplier. Furthermore, other than our current suppliers, there are a limited number of entities from whom we could obtain certain materials and components. We may also face shortages if we experience increased demand for materials or components beyond what our qualified suppliers can deliver. Our inability to obtain sufficient quantities of critical materials or components could adversely affect our ability to meet demand for our products, adversely affecting our financial condition and results of operations. **Also see the section above on the COVID-19 pandemic for details related to global supply chain disruptions.**

We typically have not entered into long-term agreements with our suppliers and, therefore, our suppliers could stop supplying materials and components to us at any time or fail to supply adequate quantities of materials or components to us on a timely basis. It is difficult, costly, time consuming and, on short notice, sometimes impossible for us to identify and qualify new suppliers. Our customers generally restrict our ability to change the components in our products. For more critical components, any changes may require repeating the entire qualification process. Our reliance on a limited number of suppliers or a single qualified vendor may result in delivery and quality problems, and reduced control over product pricing, reliability and performance.

Our products could contain defects that may cause us to incur significant costs or result in a loss of customers.

Our products are complex and undergo quality testing as well as formal qualification by our customers. Our customers' testing procedures are limited to evaluating our products under likely and foreseeable failure scenarios and over varying amounts of time. For various reasons, such as the occurrence of performance problems that are unforeseeable in testing or that are detected only when products age or are operated under peak stress conditions, our products may fail to perform as expected long after customer acceptance. Failures could result from faulty components or design, problems in manufacturing or other unforeseen reasons. Any such failures could delay product shipments to our customers or result in a loss of customers. Our products are typically embedded in, or deployed in conjunction with, our customers' products, which incorporate a variety of components, modules and subsystems and may be expected to interoperate with modules produced by third parties. As a result, not all defects are immediately detectable and when problems occur, it may be difficult to identify the source of the problem. We face this risk because our products are widely deployed in many demanding environments and applications worldwide. In addition, we may in certain circumstances honor warranty claims after the warranty has expired or for problems not covered by warranty to maintain customer relationships. Any significant product failure could result in litigation, damages, repair costs and lost future sales of the affected product and other products, divert the attention of our engineering personnel from our product development efforts and cause significant customer relations problems, all of which would harm our business. Although we carry product liability insurance, this insurance may not adequately cover our costs arising from defects in our products or otherwise.

Epidemic diseases, such as COVID-19, or the perception of their effects, could have a material adverse effect on our business, financial condition, results of operation, or cash flows.

Outbreaks of epidemic, pandemic, or contagious diseases, such as the recent COVID-19 or, historically, the Ebola virus, Middle East Respiratory Syndrome, Severe Acute Respiratory Syndrome, or the H1N1 virus, could result in business disruptions. Business disruptions could include disruptions or restrictions on our ability to travel or to distribute our products, as well as temporary closures of our facilities or the facilities of our suppliers and their contract manufacturers. Any disruption of our suppliers and their contract manufacturers or our customers would likely impact our sales and operating results. In addition, a significant outbreak of epidemic, pandemic, or contagious diseases in the human population could result in a widespread health crisis that could adversely affect the economies and financial markets of many countries, resulting in an economic downturn that could affect demand for our products. Any of these events could have a material adverse effect on our business, financial condition, results of operations, or cash flows.

The spread of COVID-19 has previously impacted our supply chain operations through restrictions, reduced capacity and shutdown of business activities by suppliers whom we rely on for sourcing components and materials and third-party partners whom we rely on for manufacturing, warehousing and logistics services. The suppliers who are responsible for most of our supply-chain constraints have begun the process of returning to normal operations. In order to minimize the impact of these and any similar disruptions, we have added additional suppliers for many key components, where it is practical to do so. We believe that these additional suppliers will be able to augment our supply of needed components, although in some cases these new suppliers' materials are more expensive than the pre-existing suppliers so a switch to these alternate suppliers could have a negative impact on gross margins and profitability. However, this is uncertain and we also cannot predict if other suppliers could encounter similar difficulties. Any disruption resulting from similar events on a larger scale or over a prolonged period could cause significant delays in supply of needed components, which would likely have a negative impact on our business, results of operations, and our financial condition.

Our ability to use our net operating losses and certain other tax attributes may be limited.

As of December 31, 2022 December 31, 2023, we had U.S. accumulated net operating loss carryforwards, or NOLs, of approximately \$111.5 \$112 million, federal and state research and development credits ("R&D credits") of \$10.5 million, \$10.9 million, business interest expense carryforwards of \$18.7 million \$26 million and foreign tax credits of \$4.6 million for U.S. federal income tax purposes. Our ability to use our net operating losses, or NOLs, to offset future taxable income may be subject to certain limitations which could subject our business to higher tax liability. We may be limited in the portion of NOL carryforwards that we can use in the future to offset taxable income for U.S. federal and state income tax purposes, and federal tax credits to offset federal tax liabilities. Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, limit the use of NOLs and tax credits after a cumulative change in corporate ownership of more than 50% occurs within a three-year period. The statutes place a formula limit on how much NOLs and tax credits a corporation can use in a tax year after a change in ownership. Avoiding an ownership change is generally beyond our control. Although the ownership changes we experienced in the past and in the year ended December 31, 2022 would not have prevented us from using all NOLs and tax credits accumulated before such ownership changes, assuming we were otherwise able to do so, we could experience another ownership change that might limit our use of NOLs and tax credits in the future. Under the Tax Cuts and Jobs Act of 2017, or Tax Act, NOLs from tax years that began after December 31, 2017 do not expire, but NOLs from tax years that began before January 1, 2018 expire after 20 years. Further, under the Tax Act, although the treatment of tax losses generated in taxable years ending before December 31, 2017 has generally not changed, tax losses generated in taxable years beginning after December 31, 2017 may offset no more than 80% of taxable income annually. Accordingly, if we generate NOLs after the tax year ended December 31, 2017, we might have to pay more federal income taxes in a subsequent year as a result of the 80% taxable income limitation than we would have had to pay under the law in effect before the Tax Act. Also, any foreign NOLs (for example NOLs in our China and Taiwan jurisdictions) are subject to different NOL expirations, generally shorter than in the US.

Our future results of operations may be subject to volatility as a result of exposure to fluctuations in currency exchange rates.

We have significant foreign currency exposure and are affected by fluctuations among the U.S. dollar, the Chinese Renminbi, or RMB, and the New Taiwan dollar, or NT dollar, because a substantial portion of our business is conducted in China and Taiwan. Our sales, raw materials, components and capital expenditures are denominated in U.S. dollars, RMB and NT dollars in varying amounts.

Foreign currency fluctuations may adversely affect our revenue and our costs and expenses, and hence our results of operations. The value of the NT dollar or the RMB against the U.S. dollar and other currencies may fluctuate and be affected by, among other things, changes in political and economic conditions. The RMB currency is no longer being pegged solely to the value of the U.S. dollar. In the long term, the RMB may appreciate or depreciate significantly in value against the U.S. dollar, depending upon the fluctuation of the basket of currencies against which it is currently valued, or it may be permitted to enter into a full float, which may also result in a significant appreciation or

depreciation of the RMB against the U.S. dollar. In addition, our currency exchange variations may be magnified by Chinese exchange control regulations that restrict our ability to convert RMB into foreign currency.

To date, we have not entered into any hedging transactions in an effort to reduce our exposure to foreign currency exchange risk. While we may decide to enter into hedging transactions in the future, the availability and effectiveness of these hedging transactions may be limited and we may not be able to successfully hedge our exposure.

Future acquisitions may adversely affect our financial condition and results of operations.

As part of our business strategy, we may pursue acquisitions of companies that we believe could enhance or complement our current product portfolio, augment our technology roadmap or diversify our revenue base. Acquisitions involve numerous risks, any of which could harm our business, including:

- difficulties integrating the acquired business;
- unanticipated costs, capital expenditures or liabilities or changes related to research in progress and product development;
- diversion of financial and management resources from our existing business;
- difficulties integrating the business relationships with suppliers and customers of the acquired business with our existing business relationships;
- risks associated with entering markets in which we have little or no prior experience; and
- potential loss of key employees, particularly those of the acquired organizations.

Acquisitions may also result in the recording of goodwill and other intangible assets subject to potential impairment in the future, adversely affecting our operating results. We may not achieve the anticipated benefits of an acquisition if we fail to evaluate it properly, and we may incur costs in excess of what we anticipate. A failure to evaluate and execute an acquisition appropriately or otherwise adequately address these risks may adversely affect our financial condition and results of operations.

Future divestitures may adversely affect our financial condition and results of operations.

We frequently evaluate our portfolio of products and may consider divestitures or exits of businesses that we no longer believe to be an appropriate strategic fit. Divestitures may adversely impact our results if we are unable to offset the dilutive impacts from the loss of revenue associated with the divested products or businesses, or mitigate overhead costs allocated to those businesses. Furthermore, the divestitures could adversely affect our ongoing business operations, including by enhancing our competitors' positions or reducing customer confidence in our ongoing brand and products. The inability to effectively and efficiently manage divestitures with the results we expect or in the timeframe we anticipate could adversely affect our financial condition and results of operations.

Natural disasters or other catastrophic events could harm our operations.

Our operations in the U.S., China and Taiwan could be subject to significant risk of natural disasters, including earthquakes, hurricanes, typhoons, flooding and tornadoes, as well as other catastrophic events, such as epidemics, **cyberattacks**, terrorist attacks or wars. For example, our corporate headquarters and wafer fabrication facility in Sugar Land, Texas is located near the Gulf of Mexico, an area that is susceptible to hurricanes. We use a proprietary MBE laser manufacturing process that requires customized equipment, and this process is currently conducted and located solely at our wafer fabrication facility in Sugar Land, Texas, such that a natural disaster, **cyberattack**, terrorist attack or other catastrophic event that affects that facility would materially harm our operations. In addition, our manufacturing facility in Taipei, Taiwan, is susceptible to typhoons and earthquakes, and our manufacturing facility in Ningbo, China, has from time to time, suffered electrical outages. Any disruption in our manufacturing facilities arising from these and other natural disasters or other catastrophic events could cause significant delays in the production or shipment of our products until we are able to shift production to different facilities or arrange for third parties to manufacture our products. We may not be able to obtain alternate capacity on favorable terms or at all. Our property insurance coverage with respect to natural disaster is limited and is subject to deductible and coverage limits. Such coverage may not be adequate or continue to be available at commercially reasonable rates and terms. The occurrence of any of these circumstances may adversely affect our financial condition and results of operation.

Legal and Regulatory Risks

We are subject to governmental export and import controls that could subject us to liability or impair our ability to compete in international markets.

We are subject to export and import control laws, trade regulations, and other trade requirements that limit which products we sell and where and to whom we sell our products. Specifically, the BIS regulates the export of most commercial items and "dual-use" goods that may have both commercial and military applications. Our products are primarily classified under Export Control Classification Numbers (ECCN) 5A991, 6A995, and EAR99. Export Control Classification requirements are **depend dependent** upon an item's technical characteristics and dictate the licensing requirements and permissible destination, end-use, end-users, and activities of the end-user. Should the regulations applicable to our products change, or the restrictions applicable to countries to which we ship our products change, then the export of our products to such countries could be restricted. As a result, our ability to export or sell our products to certain countries **and end-users** could be restricted, which could adversely affect our business, financial condition, and results of operations.

Furthermore, new policy priorities may lead to additional or new import risks affecting the flow of our products into the U.S. Changes in our products or any change in export or import regulations or related legislation, shift in approach to the enforcement or scope of existing regulations, or change in the countries, persons or technologies targeted by such regulations, could result in delayed or decreased sales of our products to existing or potential customers. In such cases, our business and the results of operations could be adversely affected.

Our business could be negatively impacted as a result of shareholder activism.

In recent years, shareholder activists have become involved in numerous public companies. Shareholder activists frequently propose to involve themselves in the governance, strategic direction, and operations of the Company. We may in the future become subject to such shareholder activity and demands. Such demands may disrupt our business and divert the attention of our management and employees, and any perceived uncertainties as to our future direction resulting from such a situation could result in the loss of potential business opportunities, be exploited by our competitors, cause concern to our current or potential customers, and make it more difficult to attract and retain qualified personnel and business partners, all of which could adversely affect our business. In addition, actions of activist shareholders may cause significant fluctuations in our stock price based on temporary or speculative market perceptions or other factors that do not necessarily reflect the underlying fundamentals and prospects of our business.

The unfavorable outcome of any pending or future litigation or administrative action and expenses incurred in connection with litigation could result in financial losses or harm to our business.

We have been, and in the future may be, subject to legal actions in the ordinary course of our operations, both domestically and internationally. **In addition, we are currently subject to claims in an arbitration proceeding relating to the termination of the Divestiture Agreement with Yuhon Optoelectronic Technology (Shanghai) Co., Ltd., as noted in Risk Factors and Management's Discussion and Analysis of Financial Condition and Results of Operations.** There can be no assurances as to the favorable outcome of any **litigation, arbitration or administrative action.** In addition it can be costly to defend **litigation such matters** and these costs could negatively impact our financial results. **As further described in that section, subsequent derivative actions and securities class actions have since been filed. This Any litigation, and any arbitration, or other such litigation administrative action** could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

Risks Related to Our Indebtedness and Future Financing

Our indebtedness and liabilities could limit the cash flow available for our operations, expose us to risks that could adversely affect our business, financial condition and results of operations and impair our ability to satisfy our obligations under our indebtedness.

As of December 31, **2022 2023**, we had approximately **\$148.9 \$114.9** million of consolidated indebtedness. We may also incur additional indebtedness to meet future financing needs. Our indebtedness could have significant negative consequences for our security holders and our business, results of operations and financial condition by, among other things:

- increasing our vulnerability to adverse economic and industry conditions;
- limiting our ability to obtain additional financing;
- requiring the dedication of a substantial portion of our cash flow from operations to service our indebtedness, which will reduce the amount of cash available for other purposes;
- limiting our flexibility to plan for, or react to, changes in our business;
- diluting the interests of our existing stockholders as a result of issuing shares of our common stock upon conversion of the **2026** Notes; and
- placing us at a possible competitive disadvantage with competitors that are less leveraged than us or have better access to capital.

Our business may not generate sufficient funds, and we may otherwise be unable to maintain sufficient cash reserves, to pay amounts due under our indebtedness, including the 2026 Notes, and our cash needs may increase in the future. In addition, our existing Credit Facility with CIT Northbridge Credit, LLC, contains, credit facilities in Asia, contain, and any future indebtedness that we may incur may contain, financial and other restrictive covenants that limit our ability to operate our business, raise capital or make payments under our other indebtedness. If we fail to comply with these covenants or to make payments under our indebtedness when due, then we would be in default under that indebtedness, which could, in turn, result in that and our other indebtedness becoming immediately payable in full.

Our loan agreements contain restrictive covenants that may adversely affect our ability to conduct our business.

We have lending arrangements with several financial institutions, including loan agreements with CIT Northbridge Credit, LLC in the U.S., and credit facilities with Shanghai Pudong Development Bank Co., Ltd. ("SPD") and China Zheshang Bank Co., Ltd. ("CZB") in China. Our loan agreements governing our long-term debt obligations in the U.S. and Asia contain certain financial and operating covenants that limit our management's discretion with respect to certain business matters. Among other things, these covenants require us to maintain certain financial ratios and restrict our ability to incur additional debt, create liens or other encumbrances, change the nature of our business, sell or otherwise dispose of assets and merge or consolidate with other entities. In addition, the Indenture governing the 2026 Notes contains covenants that limit our ability and the ability of our subsidiaries to, among other things: (i) incur or guarantee additional indebtedness or issue disqualified stock; and (ii) create or incur liens.

These restrictions may limit our flexibility in responding to business opportunities, competitive developments and adverse economic or industry conditions. Any failure by us or our subsidiaries to comply with these agreements could harm our business, financial condition and operating results. In addition, our obligations under our loan agreements with CIT Northbridge Credit, LLC are secured by our accounts receivable, inventory, instruments, intellectual property, and all business assets except real estate and foreign assets. Our credit facilities with Shanghai Pudong Development Bank Co., Ltd. SPD and China Zheshang Bank Co., Ltd. CZB are secured by real estate. A breach of any of covenants under our loan agreements, or a failure to pay interest or indebtedness when due under any of our credit facilities could result in a variety of adverse consequences, including the acceleration of our indebtedness.

We may not be able to obtain additional capital when desired, on favorable terms or at all.

We operate in a market that makes our prospects difficult to evaluate and, to remain competitive, we will be required to make continued investments in capital equipment, facilities and technological improvements. We expect that substantial capital will be required to expand our manufacturing capacity and fund working capital for anticipated growth. If we do not generate sufficient cash flow from operations or otherwise have the capital resources to meet our future capital needs, we may need additional financing to implement our business strategy, which includes:

- expansion of research and development;
- expansion of manufacturing capabilities;
- payment of any outstanding indebtedness;
- hiring of additional technical, sales and other personnel; and
- acquisitions of complementary businesses.

If we raise additional funds through the issuance of our common stock or convertible securities, the ownership interests of our stockholders could be significantly diluted. These newly issued securities may have rights, preferences or privileges senior to those of existing stockholders. Additional financing may not, however, be available on terms favorable to us, or at all, if and when needed, and our ability to fund our operations, take advantage of unanticipated opportunities, develop or enhance our infrastructure or respond to competitive pressures could be significantly limited. If we cannot raise required capital when needed, we may be unable to meet the demands of existing and prospective customers, adversely affecting our sales and market opportunities and consequently our business, financial condition and results of operations.

Risks Related to Data Breaches and Network Infrastructures

Data breaches and cyberattacks could compromise our operations, our customers' operations, or the operations of our contract manufacturers upon whom we rely, and cause significant damage to our business and reputation.

Cyberattacks have become more prevalent and much harder to detect and defend against. Companies, including companies in our industry, have been increasingly subject to a wide variety of security incidents, cyberattacks and other attempts to gain unauthorized access to their systems or to deny access and disrupt their systems and operations. These threats can come from a variety of sources, ranging in sophistication from an individual hacker to a state-sponsored attack. Cyber threats may be generic, or they may be custom-crafted against our information systems.

In the ordinary course of our business, we and our data center customers maintain sensitive data on our respective networks, including intellectual property, employee personal information and proprietary or confidential business information relating to our business and that of our customers and business partners. The secure maintenance of this information is critical to our business and reputation. Despite our implementation of network security measures, our network and storage applications have been subject to computer viruses, ransomware and other forms of cyber terrorism.

Also, despite our implementation of security measures, we are not able to guarantee that we can prevent unauthorized access by hackers or breaches due to operator error, malfeasance or other system disruptions. Our customers' network and storage applications may be subject to similar disruptions. It is often difficult to anticipate or immediately detect such incidents and the damage caused by such incidents. Data breaches and any unauthorized access or disclosure of our information, employee information or intellectual property could compromise our business, trade secrets and other sensitive business information, any of which could result in legal action against us, exposure of our intellectual property to our competitors, damages, fines and other adverse effects. A data security breach could also lead to public exposure of personal information of our employees, customers and others. Any such theft, loss or misuse of personal data collected, used, stored or transferred by us to run our business could result in significantly increased security costs or costs related to defending legal claims. Cyberattacks, such as computer viruses or other forms of cyber terrorism, have disrupted access to some of our network or storage applications. In past incidents we have been able to recover quickly without material financial impact, however such disruptions in the future may result in delays or cancellations of customer orders or delays or additional costs to produce and ship our products. Data security breaches involving our data center customers could affect their financial condition and ability to continue to purchase our products. Further, cyberattacks may cause us to incur significant remediation costs, result in product development delays, disrupt key business operations and divert attention of management and key information technology resources. These incidents could also subject us to liability, expose us to significant expense and cause significant harm to our reputation and business.

We may be subject to disruptions or failures in information technology systems and network infrastructures that could have a material adverse effect on our business and financial condition.

We rely on the efficient and uninterrupted operation of complex information technology systems and network infrastructures to operate our business. A disruption, infiltration or failure of our information technology systems as a result of software or hardware malfunctions, system implementations or upgrades, computer viruses, third-party security breaches, employee error, theft or misuse, malfeasance, power disruptions, natural disasters or accidents could cause a breach of data security, loss of intellectual property and critical data and the release and misappropriation of sensitive competitive information and partner, customer, and employee personal data. Any of these events could harm our competitive position, result in a loss of customer confidence, cause us to incur significant costs to remedy any damages and ultimately materially adversely affect our business and financial condition.

Risks Related to International Trade and Operations

Changes in U.S. and international trade policies, particularly regarding China, may materially and adversely impact our business and operating results.

The U.S. government has made statements and taken certain actions that have led and may lead to further changes to U.S. and international trade policies, including imposing additional tariffs on certain products manufactured in China. Since the beginning of 2018, there has been increasing rhetoric, in some cases coupled with legislative, administrative, or executive action, from several U.S. and foreign leaders regarding the possibility of instituting tariffs on foreign imports of certain materials. Five rounds of U.S. tariffs on imports from China (respectively the "U.S. Tariffs on China Imports") went into effect on July 2018, August 2018, September 2018, September 2019, and February 2020. A limited number of our products that are of Chinese origin are currently subject to U.S. Tariffs on China Imports.

Despite rapid changes to U.S. import laws and applicable duties, the U.S. Tariffs on China Chinese Imports remain in place, and the Company faces a variety of import-related risk. Because of the political nature of many actions, it is unknown whether and to what extent new tariffs (or other new laws or regulations) will be adopted, or the effect that any such actions would have on us or our industry. A significant portion of our manufacturing operations are based in Ningbo, China; therefore, there could be material adverse effects on our business, financial condition, and/or cash flow if any new tariffs, legislation and/or regulations are implemented, or if existing trade agreements are renegotiated or if China or other affected countries take further retaliatory trade actions.

Furthermore, the implementation of trade tariffs both globally and between the U.S. and China specifically carries the risk of negatively impacting China's overall economic condition, which could negatively affect our business. Bilateral tariffs could cause a decrease in the sales of our products to customers located in China or other customers selling to Chinese end users.

The Company's ability to export U.S.-made products is primarily subject to the regulatory supervision of the Bureau of Industry and Security (BIS) of the U.S. Department of Commerce. Because the Company's focus on telecommunications products is a priority trade issue for BIS, the Company actively monitors licensing and export policy for our products.

Significant changes to existing international trade agreements could also lead to sourcing or logistics disruption resulting from import delays or the imposition of increased tariffs on our sourcing partners. For example, the Chinese government could require the use of local suppliers, compel companies that do business in China to partner with local companies, and otherwise provide additional government incentives or subsidies to government-backed local customers to buy from local suppliers. Changes in and responses to U.S. trade policy could reduce the competitiveness of our products and thus cause our sales and revenues to drop, which could materially and adversely impact our business and operations.

We face a variety of risks associated with our international sales and operations.

We currently derive and expect to continue to derive, a significant portion of our revenue from sales to international customers. In 2023, 2022, 2021 and 2020, 2021, 18.53%, 27.7%, 22.7%, 18.5%, and 25.4%, 22.7% of our revenue, respectively, was derived from sales outside of North America. In addition, a significant portion of our manufacturing operations are based in Ningbo, China, and Taipei, Taiwan.

Trade-related government actions by the U.S., China or other countries that impose barriers or restrictions that would impact our ability to sell or ship products to customers or potential customers may have a negative impact on our financial condition and operations. We cannot predict the actions government entities may take in this context and we may be unable to quickly or effectively react to government actions that restrict our ability to sell to certain customers or those in certain jurisdictions. Government actions that affect our customers' ability to sell products or access critical elements of their supply chains may result in a decreased demand for their products, which may consequently reduce their demand for our products.

Our international revenue and operations are subject to several material risks, including:

- difficulties in staffing, managing and supporting operations in more than one country;
- difficulties in enforcing agreements and collecting receivables through foreign legal systems;
- fewer legal protections for intellectual property in foreign jurisdictions;
- foreign and U.S. taxation issues and international trade barriers, including the adoption or expansion of governmental trade tariffs, export controls, and fluctuating changes to end-use and end-user rules;
- difficulties in obtaining any necessary governmental authorizations for the export of our products to certain foreign jurisdictions;
- fluctuations in foreign economies including the impact of recessionary environments and inflation in the United States and other economies where we do business;
- fluctuations in the value of foreign currencies and interest rates, including the impact of recessionary environments and inflation in the United States and other economies where we do business;
- trade and travel restrictions;
- domestic and international economic or political changes, hostilities and other disruptions in regions where we currently operate or may operate in the future;
- difficulties and increased expenses in complying with a variety of U.S. and foreign laws, regulations, and trade standards, including the Foreign Corrupt Practices Act and various modifications by the BIS to export policy; and
- different and changing legal and regulatory requirements in the jurisdictions we currently operate or may operate in the future.

Negative developments in any of these factors in China, or Taiwan, or other countries could result in a reduction in demand for our products, the cancellation or delay of orders already placed, difficulties in producing and delivering our products, threats to our intellectual property, difficulty in collecting receivables, and a higher cost of doing business. Although we maintain compliance programs throughout the Company, violations of U.S. and foreign laws and regulations may result in criminal or civil sanctions, including material monetary fines, penalties and other costs against us or our employees, and may have a material adverse effect on our business.

Our business operations conducted in China and Taiwan are important to our success. A substantial portion of our property, plants, and equipment is located in China and Taiwan. We expect to make further investments in Asia in the future, pending completion of the Divestiture described above. Therefore, our business, financial condition, results of operations and prospects are subject to economic, political, legal, and social events and developments in Asia. Factors affecting military, political or economic conditions between China and Taiwan could have a material adverse effect on our financial condition and results of operations, as well as the market price and the liquidity of our common shares.

Risks Related to Our Operations in China

Pending the completion of the Divestiture described above, our business operations conducted in China are critical to our success. A total of \$43.3 million, \$51.3 million, and \$97.7 million and \$85.2 million or 19.9%, 23.0%, 46.2%, and 36.3% 46.2%, of our revenue in the years ended December 31, 2023, 2022 2021 and 2020 2021 was attributable to our product manufactured at our plant in China, respectively. Additionally, a substantial portion of our property, plant and equipment, 42.2% 43.0%, 42.2%, and 40.6% 42.2% as of December 31, 2023, 2022 2021 and 2020 2021, was located in China, respectively. We expect to make further investments in China in the foreseeable future. Therefore, our business, financial condition, results of operations and prospects are to a significant degree subject to economic, political, legal, and social events and developments in China.

Adverse changes in economic and political policies in China, or Chinese laws or regulations could have a material adverse effect on business conditions and the overall economic growth of China, which could adversely affect our business.

The Chinese economy differs from the economies of most developed countries in many respects, including the level of government involvement, level of development, growth rate, control of foreign exchange and allocation of resources. The Chinese economy has been transitioning from a planned economy to a more market-oriented economy. Despite reforms, the government continues to exercise significant control over China's economic growth by way of the allocation of resources, control over foreign currency-denominated obligations and monetary policy and provision of preferential treatment to particular industries or companies.

In addition, the laws, regulations and legal requirements in China, including the laws that apply to foreign-invested enterprises, or FIEs, are subject to frequent changes. The interpretation and enforcement of such laws is uncertain. Protections of intellectual property rights and confidentiality in China may not be as effective as in the U.S. or other countries or regions with more developed legal systems. Any litigation in China may be protracted and result in substantial costs and diversion of resources and management attention. Any adverse changes to these laws, regulations and legal requirements or their interpretation or enforcement could have a material adverse effect on our business.

Furthermore, while China's economy has experienced rapid growth in the past 20 years, growth has been uneven across different regions, among various economic sectors and over time. China has also in the past and may in the future experience economic downturns due to, for example, government austerity measures, changes in government policies relating to capital spending, limitations placed on the ability of commercial banks to make loans, reduced levels of exports and international trade, inflation, lack of financial liquidity, stock market volatility and global economic conditions. Any of these developments could contribute to a decline in business and consumer spending in addition to other adverse market conditions, which could adversely affect our business.

The turnover of direct labor in manufacturing industries in China is high, which could adversely affect our production, shipments and results of operations.

Employee turnover of direct labor in the manufacturing sector in China is extremely high and retention of such personnel is a challenge to companies located in or with operations in China. Although direct labor costs do not represent a high proportion of our overall manufacturing costs, direct labor is required for the manufacture of our products. If our direct labor turnover rates are higher than we expect, or we otherwise fail to adequately manage our direct labor turnover rates, then our results of operations could be adversely affected.

Chinese regulation of loans to and direct investment by offshore holding companies in China entities may delay or prevent us from making loans or additional capital contributions to our China subsidiary.

Any loans that we wish to make to our China subsidiary are subject to Chinese regulations and approvals. For example, any loans to our China subsidiary to finance their activities cannot exceed statutory limits, must be registered with State Administration of Foreign Exchange, or SAFE, or its local counterpart, and must be approved by the relevant government authorities. Any capital contributions to our China subsidiary must be approved by the Ministry of Commerce or its local counterpart. In addition, under Circular 142, our China subsidiary, as a FIE, may not be able to convert our capital contributions to them into RMB for equity investments or acquisitions in China.

We cannot assure you that we will be able to obtain these government registrations or approvals on a timely basis, if at all, with respect to our future loans or capital contributions to our China subsidiary. If we fail to receive such registrations or approvals, our ability to capitalize our China subsidiary may be negatively affected, which could materially and adversely affect our liquidity and ability to fund and expand our business.

Our China subsidiary is subject to Chinese labor laws and regulations, and Chinese labor laws may increase our operating costs in China.

Chinese labor laws and regulations provide certain protections for our employees located in China, and changes to those labor laws and regulations may increase our costs and reduce our flexibility. The China Labor Contract Law, which went into effect in 2008, together with its implementing rules, provides increased rights to Chinese employees compared to prior employment laws in China. Under the rules under the China Labor Contract Law, the probation period varies depending on contract terms and the employment contract can only be terminated during the probation period for cause upon three days' notice. Additionally, an employer may not be able to terminate a contract during the probation period on the grounds of a material change of circumstances or a mass layoff. The law also has specific provisions on conditions when an employer has to sign an employment contract with open-ended terms. If an employer fails to enter into an open-ended contract in certain circumstances, the employer must pay the employee twice their monthly wage

beginning from the time the employer should have executed an open-ended contract. Additionally, an employer must pay severance for nearly all terminations, including when an employer decides not to renew a fixed-term contract. Any further changes to these laws may increase our costs and reduce our flexibility.

Risks Related to Our Divestiture in the PRC

The termination of our proposed sale of our China manufacturing facilities and claims asserted by the intended purchaser could materially adversely affect our business, financial condition, and results of operations.

On September 15, 2022, AOI and Prime World International Holdings Ltd. (the "Seller") entered into a definitive agreement (the "Purchase Agreement") with Yuhan Optoelectronic Technology (Shanghai) Co., Ltd. (the "Purchaser") pursuant to which the Seller would divest its manufacturing facilities located in the People's Republic of China and certain assets related to its transceiver business and multichannel optical sub-assembly products for the internet data center, FTTH and telecom markets. On September 12, 2023, we delivered a notice of termination to the Purchaser to terminate the Purchase Agreement as a result of the Purchaser's failure to satisfy certain of its material obligations under the Purchase Agreement. In doing so, we also asserted the right to recover a break-up fee from the Purchaser. On December 22, 2023, the Purchaser filed for arbitration in Hong Kong with the Hong Kong International Arbitration Centre disputing the validity of our termination notice and seeking specific performance with respect to the transaction contemplated by the Purchase Agreement, which would in any case remain subject to regulatory approvals. A hearing has not been set for the arbitration and we are not able to predict the outcome of this dispute with certainty at this time. However, any costs, damages or other losses we might incur in connection with the arbitration, as well as any injunction or other equitable remedy we may be subject to, could adversely affect our operations and financial conditions, divert management's attention and seriously harm our business.

Risks Related to Intellectual Property Matters

If we fail to protect, or incur significant costs in defending, our intellectual property and other proprietary rights, our business and results of operations could be materially harmed.

Our success depends on our ability to protect our intellectual property and other proprietary rights. We rely on a combination of patent, trademark, copyright, trade secret and unfair competition laws, as well as license agreements and other contractual provisions, to establish and protect our intellectual property and other proprietary rights. We have applied for patents in the U.S. and in other foreign countries, some of which have been issued. In addition, we have registered certain trademarks in the U.S. We cannot guarantee that our pending applications will be approved by the applicable governmental authorities. Moreover, our existing and future patents and trademarks may not be sufficiently broad to protect our proprietary rights or may be held invalid or unenforceable in court. A failure to obtain patents or trademark registrations or a successful challenge to our patents and trademark registrations in the U.S. or other foreign countries may limit our ability to protect the intellectual property rights that these patent and trademark registrations intended to cover.

Policing unauthorized use of our technology is difficult and we cannot be certain that the steps we have taken will prevent the misappropriation, unauthorized use or other infringement of our intellectual property rights. Further, we may not be able to effectively protect our intellectual property rights from misappropriation or other infringement in foreign countries where we have not applied for patent protections and where effective patent, trademark, trade secret and other intellectual property laws may be unavailable, or may not protect our proprietary rights as fully as U.S. law. We may seek to secure comparable intellectual property protections in other countries. However, the level of protection afforded by patent and other laws in other countries may not be comparable to that afforded in the U.S.

We also attempt to protect our intellectual property, including our trade secrets and know-how, through the use of trade secret and other intellectual property laws, and contractual provisions. We enter into confidentiality and invention assignment agreements with our employees and independent consultants. We also use non-disclosure agreements with other third parties who may have access to our proprietary technologies and information. Such measures, however, provide only limited protection, and there can be no assurance that our confidentiality and non-disclosure agreements will not be breached, especially after our employees end their employment, and that our trade secrets will not otherwise become known by competitors or that we will have adequate remedies in the event of unauthorized use or disclosure of proprietary information. Unauthorized third parties may try to copy or reverse engineer our products or portions of our products, otherwise obtain and use our intellectual property, or may independently develop similar or equivalent trade secrets or know-how. If we fail to protect our intellectual property and other proprietary rights, or if such intellectual property and proprietary rights are infringed, misappropriated or duplicated, our business, results of operations or financial condition could be materially harmed.

In the future, we may need to take legal actions to prevent third parties from infringing upon or misappropriating our intellectual property or from otherwise gaining access to our technology. Protecting and enforcing our intellectual property rights and determining their validity and scope could result in significant litigation costs and require significant time and attention from our technical and management personnel, which could significantly harm our business. We may not prevail in such proceedings, and an adverse outcome may adversely impact our competitive advantage or otherwise harm our financial condition and our business.

We may be involved in intellectual property disputes in the future, which could divert management's attention, cause us to incur significant costs and prevent us from selling or using the challenged technology.

Participants in the markets in which we sell our products have experienced frequent litigation regarding patent and other intellectual property rights. While we have a policy in place that is designed to reduce the risk of infringement of intellectual property rights of others and we have conducted a limited review of other companies' relevant patents, there can be no assurance that third parties will not assert infringement claims against us. We cannot be certain that our products would not be found infringing on the intellectual property

rights of others. Regardless of their merit, responding to such claims can be time consuming, divert management's attention and resources and may cause us to incur significant expenses. Intellectual property claims against us could force us to do one or more of the following:

- obtain from a third party claiming infringement a license to the relevant technology, which may not be available on reasonable terms, or at all;
- stop manufacturing, selling, incorporating or using our products that use the challenged intellectual property;
- pay substantial monetary damages; or
- expend significant resources to redesign the products that use the technology and to develop non-infringing technology.

Any of these actions could result in a substantial reduction in our revenue and could result in losses over an extended period of time.

In any potential intellectual property dispute, our customers could also become the target of litigation. Because we often indemnify our customers for intellectual property claims made against them with respect to our products, any claims against our customers could trigger indemnification claims against us. These obligations could result in substantial expenses such as legal expenses, damages for past infringement or royalties for future use. Any indemnity claim could also adversely affect our relationships with our customers and result in substantial costs to us.

Risks Related to Our Common Stock

Our stock price has been and is likely to be volatile.

The market price of our common stock has been and is likely to be subject to wide fluctuations in response to, among other things, the risk factors described in this section of this Form 10-K, and other factors beyond our control, such as fluctuations in the valuation of companies perceived by investors to be comparable to us. For example, announcements made by competitors regarding factors influencing their business may cause fluctuations in the valuation of companies throughout our industry, including fluctuations in the valuation of our stock.

Furthermore, the stock markets have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political and market conditions, such as recessions, interest rate changes or international currency fluctuations, may negatively affect the market price of our common stock.

In the past, many companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We have been and may become the target of this type of litigation in the future.

Our charter documents, stock incentive plans and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.

Our amended and restated certificate of incorporation and our amended and restated bylaws and our stock incentive plans contain provisions that could delay or prevent a change in control of our company. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions. These provisions include:

- providing for a classified board of directors with staggered, three-year terms;
- not providing for cumulative voting in the election of directors;
- authorizing our board of directors to issue, without stockholder approval, preferred stock rights senior to those of common stock;
- prohibiting stockholder action by written consent;
- limiting the persons who may call special meetings of stockholders;

- requiring advance notification of stockholder nominations and proposals; and
- change of control provisions in our stock incentive plans, and the individual stock option agreements, which provide that a change of control may accelerate the vesting of the stock options and equity awards issued under such plans.

In addition, we are governed by the provisions of Section 203 of the Delaware General Corporate Law. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding common stock, from engaging in certain business combinations without the approval of substantially all of our stockholders for a certain period of time.

These and other provisions in our amended and restated certificate of incorporation, our amended and restated bylaws and under Delaware law could discourage potential takeover attempts, reduce the price that investors might be willing to pay for shares of our common stock in the future and result in the market price being lower than it would be without these provisions.

Our Amended and Restated Certificate of Incorporation includes a forum selection clause, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us.

Our Amended and Restated Certificate of Incorporation provides that, unless the Company consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or the Company's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or the Company's Amended and Restated Certificate of Incorporation or By-laws, or (iv) any action asserting a claim against the Company governed by the internal affairs doctrine. This exclusive forum provision will not apply to claims under the Securities Exchange Act of 1934 but will apply to other state and federal law claims including actions arising under the Securities Act of 1933 (although our stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder). Section 22 of the Securities Act of 1933, however, creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act of 1933 or the rules and regulations thereunder. Accordingly, there is uncertainty as to whether a court would enforce such a forum selection provision as written in connection with claims arising under the Securities Act of 1933. This forum selection provision in our Amended and Restated Certificate of Incorporation may limit our stockholders' ability to obtain a favorable judicial forum for disputes with us. It is also possible that a court could rule that such a provision is inapplicable or unenforceable.

Item 1B. Unresolved Staff Comments

None.

Item 1C. Cybersecurity

Cyber criminals are becoming more sophisticated and effective every day. All companies utilizing technology are subject to threats of breaches of their cybersecurity programs. To mitigate the threat to our business, we take a comprehensive approach to cybersecurity risk management and make securing the data customers and other stakeholders entrust to us a top priority. Our board of directors (the "Board") and our management are actively involved in the oversight of risk management program, of which cybersecurity represents an important component. As described in more detail below, we have established policies, standards, processes and practices for assessing, identifying, and managing material risks from cybersecurity threats. We have devoted financial and personnel resources to implement and maintain security measures to meet regulatory requirements and customer expectations, and we intend to continue to make investments to maintain the security of our data and cybersecurity infrastructure. There can be no guarantee that our policies and procedures will be properly followed in every instance or that those policies and procedures will be effective. Our Risk Factors include further detail about the material cybersecurity risks we face and have faced in the past. We can provide no assurance that there will not be incidents in the future or that they will not materially affect us, including our business strategy, results of operations, or financial condition.

Risk Management and Strategy

Our policies, standards, processes and practices for assessing, identifying, and managing material risks from cybersecurity threats are integrated into our overall risk management. Our cybersecurity program in particular focuses on the following key areas:

Collaboration

Our cybersecurity risks are identified and addressed through a cross-functional approach. Key security, risk, and compliance stakeholders meet to develop strategies for preserving the confidentiality, integrity and availability of Company and customer information, identifying, preventing and mitigating cybersecurity threats, and effectively responding to cybersecurity incidents. We maintain controls and procedures that are designed to ensure prompt escalation of certain cybersecurity incidents so that decisions regarding public disclosure and reporting of such incidents can be made by management and the Board in a timely manner.

Risk Assessment

At least annually, we conduct a cybersecurity risk assessment that takes into account information from internal stakeholders, known information security vulnerabilities, and information from external sources (e.g., reported security incidents that have impacted other companies, industry trends, and evaluations by third parties and consultants). The results of the assessment are used to drive alignment on, and prioritization of, initiatives to enhance our security controls, make recommendations to improve processes, and inform a broader enterprise-level risk assessment that is presented to our Board and members of management.

Technical Safeguards

We regularly assess and deploy technical safeguards designed to protect our information systems from cybersecurity threats. Such safeguards are regularly evaluated and improved based on vulnerability assessments, cybersecurity threat intelligence and incident response experience.

Incident Response and Recovery Planning

We have established comprehensive incident response and recovery plans and continue to evaluate the effectiveness of those plans. Our incident response and recovery plans address — and guide our employees, management and the Board on — our response to a cybersecurity incident.

Education and Awareness

Our policies require our employees to contribute to our data security efforts. We provide awareness training to our employees to help identify, avoid and mitigate cybersecurity threats. Our employees participate annually in required training, including spear phishing and other awareness training.

Governance

Board and Management Oversight

Our Board oversees our management of cybersecurity risk. They receive regular reports from management about the prevention, detection, mitigation, and remediation of cybersecurity incidents, including material security risks and information security vulnerabilities.

Our general manager and MIS director have primary responsibility for assessing and managing material cybersecurity risks. They meet to review security performance metrics, identify security risks, and assess the status of approved security enhancements. They also consider and make recommendations on security policies and procedures, security service requirements, and risk mitigation strategies.

Our MIS director has served in various roles in information technology and information security for over 20 years. Our general manager has over 20 years of experience managing risks, including risks arising from cybersecurity threats.

Item 2. Properties

We maintain manufacturing, research and development, sales and administrative offices in the U.S., China and Taiwan. Our corporate headquarters is located at our facility in Sugar Land, Texas. The table below provides information regarding our facilities.

Location	Owned or Lease Expiration Date	Approximate Square Footage	Use
Sugar Land, Texas	Owned (1)	139,450	Administration, sales, manufacturing, research and development
Duluth, Georgia	Leased (2)	10,459	Sales, research and development
Ningbo, China	Owned (2)(3)	458,849	Administration, sales, manufacturing, research and development
Taipei, Taiwan	May 31, 2029 (3)(4)	268,797	Administration, sales, manufacturing, research and development

(1) We manufacture laser chips (utilizing our MBE and MOCVD process), subassemblies and components in our Sugar Land, Texas facility.

(2) In our Georgia facility, we have sales and research and development for CATV market, and the lease covering the 2,932 square feet facility will expire October 31, 2024 and the lease covering the 7,527 square feet will expire December 31, 2025.

(2) (3) In our China facility, we manufacture certain more labor intensive components and optical equipment systems, such as optical subassemblies and transceivers for the CATV transmitters (at the headend), CATV outdoor equipment (at the node) and internet data center market. Our China subsidiary acquired the land use rights to the real property on which our current facility is located from the Chinese government. Such land use rights expire on October 7, 2054. Our China subsidiary owns the facility located on such real property. Our China subsidiary also obtained from the Chinese government the land use rights to a second real property located within a close proximity to our current facility. The land use rights for the second real property expire on December 28, 2067.

(3) (4) In our Taiwan location, we manufacture optical components, such as our butterfly lasers, which incorporate laser chips, subassemblies and components manufactured within our Sugar Land facility. In addition, in our Taiwan location, we manufacture transceivers for the internet data center market, telecom, FTTH and other markets. The lease covering the Taiwan facility commenced on June 1, 2014 and expires on May 31, 2029.

Item 3. Legal Proceedings

The information set forth under Note T "Contingencies" included in Part II, Item 8 of this Form 10-K, is incorporated herein by reference. For an additional discussion of certain risks associated with legal proceedings, see "Risk Factors" above.

Item 4. Mine Safety Disclosure

Not Applicable.

PART II

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

On September 26, 2013, our common stock began to trade on the NASDAQ Global Market under the symbol "AAOI". Prior to that time, there was no public market for our common stock. As of February 21, 2023 February 20, 2024 there were 36 35 holders of record of our common stock (not including beneficial holders of our common stock holding in street name).

For equity compensation plan information refer to Item 12 of this Form 10-K.

Dividend Policy

We have never declared or paid any cash dividends on our capital stock, and we do not anticipate paying any cash dividends on our common stock for the foreseeable future. We currently intend to retain all available funds and future earnings for use in the operation and expansion of our business. Any future determination to pay cash dividends will be at the discretion of our board of directors and will depend upon our financial condition, results of operations, terms of financing arrangements, applicable Delaware law, capital requirements and such other factors as our board of directors deems relevant. In addition, the terms of our loan agreements governing our long-term debt obligations restricts us from paying dividends.

Unregistered Sales of Equity Securities

Not applicable.

Item 6. [Reserved]

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

You should read the following discussion and analysis of our financial condition and results of operations in conjunction with our consolidated financial statements and the accompanying notes appearing elsewhere in this Form 10-K. This discussion and other parts of this Form 10-K contain forward-looking statements that involve risks and uncertainties, such as statements of our plans, objectives, expectations and intentions. Our actual results could differ materially from those discussed in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in "Risk Factors." This section generally discusses the results of our operations for the year ended December 31, 2022 December 31, 2023 compared to the year ended December 31, 2021 December 31, 2022. For a discussion of the year

ended **December 31, 2021** **December 31, 2022** compared to the year ended **December 31, 2020** **December 31, 2021**, please refer to Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the year ended **December 31, 2021** **December 31, 2022**, as amended.

Overview

We are a leading, vertically integrated provider of fiber-optic networking products. We target four networking end-markets: **CATV**, internet data centers, **CATV**, telecom and FTTH. We design and manufacture a range of optical communications products at varying levels of integration, from components, subassemblies and modules to complete turn-key equipment. In designing products for our customers, we begin with the fundamental building blocks of lasers and laser components. From these foundational products, we design and manufacture a wide range of products to meet our customers' needs and specifications, and such products differ from each other by their end market, intended use and level of integration. We are primarily focused on the higher-performance segments within the **CATV**, internet data center, **CATV**, telecom and FTTH markets which increasingly demand faster connectivity and innovation. Our vertically integrated manufacturing model provides us several advantages, including rapid product development, fast response times to customer requests and control over product quality and manufacturing costs.

The four end markets we target are all driven by significant bandwidth demand fueled by the growth of network-connected devices, video traffic, cloud computing and online social networking. Within the CATV market, we benefit from a number of ongoing trends including the move to higher bandwidth networks among CATV service providers and the outsourcing of system design among CATV networking equipment companies. Within the internet data center market, we benefit from the increasing use of higher-capacity optical networking technology as a replacement for copper cables, older, lower-speed optical interconnects, particularly as speeds reach 10 800 Gbps and above, as well as the movement to open internet data center architectures and the increasing use of in-house equipment design among leading internet companies. Within the CATV market, we benefit from a number of ongoing trends including the move to higher bandwidth networks among CATV service providers, especially the desire by MSOs to increase the return-path bandwidth available to offer to their customers. In the FTTH market, we benefit from continuing PON deployments and system upgrades among telecom service providers. In the telecom market, we benefit from deployment of new high-speed fiber-optic networks by telecom network operators, including 5G networks.

In 2023, 2022 2021 and 2020 2021, our revenue was \$217.6 million, \$222.8 million, \$211.6 million, and \$234.6 million \$211.6 million, and our gross margin was 15.1% 27.1%, 17.8% 15.1%, and 21.5% 17.8%, respectively. We have grown our annual revenue at a compound annual growth rate, or CAGR, of 11.0% 10.7% between 2013 and 2022 2023. In the years ended December 31, 2023, 2022 2021 and 2020 2021, we had net loss of \$66.4 million, \$56.0 million, \$66.4 million, and \$54.2 million, and \$58.5 million, respectively. At December 31, 2022 2023 and 2021 2022, our accumulated deficit was \$209.1 million \$265.1 million and \$142.7 million, \$209.1 million, respectively. In 2022 2023, we earned 53.0% of our total revenue from the CATV market and 34.6% 64.9% of our total revenue from the internet data center market and 27.5% of our total revenue from the CATV market.

We sell our products to leading OEMs in the CATV, telecom, and FTTH markets as well as internet data center operators, operators and CATV MSOs. In 2022 2023, revenue from the CATV market, internet data center market, CATV market, telecom market and FTTH markets provided 53.0% 64.9%, 27.5%, 6.4%, and 0.0% of our revenue, respectively, compared to 34.6%, 53%, 11.1%, and 0.1% of our revenue, respectively, compared to 44.6%, 46.1%, 7.7%, and 0.5% of our 2021 2022 revenue, respectively. In 2023, our key customers in the internet data center market included Microsoft, a U.S. based large data center operator, and a China based datacenter equipment manufacturer. In 2023, 2022, and 2021, Microsoft accounted for 46.6%, 18.4%, and 14.1% of our revenue, a U.S. based large data center operator accounted for 8.8%, 5.9% and 8.3% of our revenue and China based manufacture accounted for 3.3%, 1.2% and 1.2% of our revenue, respectively. In 2023, our key customers in the CATV market included ATX, Cisco, Digicommm and CommScope, a U.S. based large CATV equipment provider. In 2023, 2022, 2021, and 2020 2021, ATX accounted for 47.3% 15.6%, 25.6% 47.3%, and 3.7% 25.6% of our revenue, Cisco Digicommm accounted for 1.9% 11.3%, 11.9% 0%, and 7.5% 0% of our revenue, and CommScope accounted for 1.7%, 3.3% and 2.1% of our revenue, respectively. Data center market included, Microsoft, a U.S. based large datacenter operator and a U.S. based NEM company. In 2022, 2021, and 2020, Microsoft CATV equipment provider accounted for 18.4% 1.3%, 14.11%, 1.7% and 38.3% of our revenue, the U.S. based large datacenter operator accounted for 5.9%, 8.3%, and 8.0% of our revenue, and the U.S. based NEM company accounted for 3.6%, 7.2% and 7.9% 3.3% of our revenue, respectively.

In 2022 2023, our decrease of revenue increase of 5.3% 2.3% over the prior-year was driven primarily by strong decreased demand in the CATV product sales market, which we believe is due to reductions in purchasing of older generation DOCSIS 3.1 equipment, which was nearly offset by increased demand for our internet datacenter products, which we believe is arising from demand for products necessary for new datacenter construction along with architecture improvements datacenter upgrades to enable delivery of additional bandwidth to consumers. The increase in bandwidth demand was particularly acute in the upstream direction, and sales of products associated with increased return-path bandwidth were notably strong in the year. The increase was offset by the decrease of data center sales related to inventory normalization and demand decrease. new technologies like Artificial Intelligence (AI). Based on customer forecasts and order backlog we believe that this elevated CATV datacenter demand will likely continue into 2023. 2024. We also believe that sales in our CATV market will increase in 2024 as a result of DOCSIS 4.0 products which we plan to release in 2024.

We expect continued sales of our 40 Gbps and 100 Gbps products in 2023, 2024, and we expect that sales of 100 400 Gbps products will likely exceed sales of 40 100 Gbps products, products later in 2024. However, quarter-to-quarter results may show considerable variability as is usual in a period of technology transition. Similar to revenue, our gross margins can fluctuate materially depending on a variety of factors including average selling price changes, product mix, global supply chain situation, raw material cost reduction or increase, manufacturing utilization rate and changes in manufacturing efficiency. Furthermore, we are continuing to monitor and assess the effects of the coronavirus outbreak on our commercial and manufacturing operations, including any impact on our revenue in 2023.

Our sales model focuses on direct engagement and close coordination with our customers to determine product design, qualifications, performance and price. Our strategy is to use our direct sales force to sell to key accounts and to expand our use of distributors for increased coverage in certain international markets and certain domestic market segments. We have direct sales personnel that cover the U.S., Taiwan and China focusing primarily on major OEM customers and internet data center operators, operators along with CATV MSOs. Throughout our sales cycle, we work closely with our customers to qualify our products into their product lines. As a result, we strive to build strategic and long-lasting customer relationships and deliver products that are customized to our customers' requirements.

Our business depends on winning competitive bid selection processes to develop components, systems and equipment for use in our customers' products. These selection processes are typically lengthy, and as a result our sales cycles will vary based on the level of customization required, market served, whether the design win is with an existing or new customer and whether our solution being designed in our customers' product is our first generation or subsequent generation product. We do not have any long-term purchase commitments (in excess of one year) with any of our customers, most of whom purchase our products on a purchase order basis, however, once one of our solutions is incorporated into a customer's design, we believe that our solution is likely to continue to be purchased for that design throughout that product's life cycle because of the time and expense associated with redesigning the product or substituting an alternative solution.

In 2023, 2022, 2021 and 2020, we had 6, 12, 20, and 30 design wins, respectively. We define a design win as the successful completion of the evaluation stage, where our customer has tested our product, verified that our product meets substantially all of their requirements and has informed us that they intend to purchase the product from us. Although we believe that our ability to obtain design wins is a key strength and can provide meaningful and recurring revenue, an increase or decrease in the mere number of design wins does not necessarily correlate to a likely increase or decrease in revenue, particularly in the short term. As such, the number of design wins we achieve on a quarterly or annual basis and any increase or decrease in design wins will not necessarily result in a corresponding increase or decrease in revenue in the same or immediately succeeding quarter or year. For example, if our total number of design wins in an annual or quarterly period increases or decreases compared to the total number of design wins in a prior period, this does not necessarily mean that our revenue in such period will be higher or lower than our revenue in the prior period. In fact, our experience is that some design wins result in significant revenue and some do not, and the timing of such revenue is difficult to predict as it depends on the success of the end customer's product that uses our components. Thus, some design wins result in orders and significant revenue shortly after the design win is awarded and other design wins do not result in significant orders and revenue for several months or longer after the initial design win (if at all). We do believe that over a period of years the collective impact of design wins correlates to our overall revenue growth.

Termination of the Divestiture Agreement with Yuhon Optoelectronic Technology (Shanghai) Co., Ltd.

On September 15, 2022, we the Company and Prime World International Holdings Ltd. (the "Seller") entered into a definitive agreement and announced the planned divestiture to sell Purchase Agreement with Yuhon Optoelectronic Technology (Shanghai) Co., Ltd. (the "Purchaser") for the sale of the manufacturing facilities in the People's Republic of China ("PRC") and certain assets related to our its transceiver business and multi-channel optical sub-assembly products to Yuhon Optoelectronic Technology (Shanghai) Co. products. On September 12, 2023, Ltd. ("Purchaser"), which is we delivered a company incorporated in the PRC. The transaction is expected to close within 2023 subject notice of termination to the satisfaction of certain closing conditions, including Purchaser to terminate the CFIUS approval.

The purchase price for this transaction will be an amount equal to the \$150 million USD equivalent of Renminbi less a holdback amount. Prior to the closing of this transaction, the Company anticipates investing an amount equal to between 4% and 10% of the estimated proceeds from the transaction in exchange for a 10% equity interest in the Purchaser. The proceeds from the transaction will enable the Company to make strategic investments in higher margin and higher growth opportunities. By exiting the transceiver market, the Company will focus its resources on its CATV business and manufacturing lasers and laser components for the CATV, datacenter, telecom and FTTH markets.

Our management has performed an evaluation as required by ASC-360-10-45-9 to determine whether to classify certain of our assets and liabilities as held for sale as of December 31, 2022. ASC 360 requires that a company classifies a business as held for sale in the period in which management commits to a plan to sell the business, the business is available for immediate sale in its present condition, an active program to complete the plan to sell the business is initiated, the sale of the business within one year is probable and the business is being marketed at a reasonable price in relation to its fair value. Although we have announced the execution of a definitive purchase agreement regarding the Divestiture, completion of this transaction is not certain for reasons that include the fact that the proposed sale is subject to regulatory approval in the US and China, the timing and likelihood of which is uncertain and beyond our control, and the fact that we cannot be certain that the buyer will not request modification of terms within the definitive purchase agreement. As a result, we have concluded that at the present time the business is not "available for immediate sale" under the meaning defined in ASC 360 and therefore none of our assets or liabilities should be classified as held for sale.

COVID-19 Pandemic

The COVID-19 pandemic has had, and continues to have, a significant impact around the world. We are subject to risks and uncertainties Purchase Agreement as a result of the COVID-19 pandemic. The extent Purchaser's failure to satisfy certain of its material obligations under the impact of Purchase Agreement. In doing so, we also asserted the COVID-19 pandemic on our business is highly uncertain and difficult right to predict as COVID-19 continues to spread around recover a break-up fee from the world. In March 2020, we instituted travel restrictions and implemented sanitation and disinfection procedures to safeguard Purchaser. On December 22, 2023, the health and safety Purchaser filed for arbitration in Hong Kong with the Hong Kong International Arbitration Centre disputing the validity of our employees which continue today. With increased vaccinations termination notice and the potential reduction of infections, we implemented procedures for a safe return seeking specific performance with respect to the office environment transactions contemplated by the Purchase Agreement, which would in any case remain subject to regulatory approvals. We filed our response on January 22, 2024, generally denying the Purchaser's allegations and asserting certain counterclaims. A hearing for all the arbitration has not been set. While we do not believe the Purchaser's claims have merit, we are not able to determine the outcome of this dispute or the likelihood or amount of our employees loss or recovery, if any, arising from this matter. For more information regarding this

dispute, see Note T "Contingencies" included in 2021. China experienced the world's largest COVID-19 surge Part II, Item 8 of the pandemic in December 2022 after the end of the zero-COVID policy. Yet there is minimum impact to the labor force in China due to less government's restrictions on quarantine and testing.

The spread of COVID-19 has impacted our supply chain operations through restrictions, reduced capacity and shutdown of business activities by suppliers whom we rely on for sourcing components and materials and third-party partners whom we rely on for manufacturing, warehousing and logistics services. Our supply chain restrictions due to COVID-19 have improved during the latter part of 2022, and we continue to expect improvements in 2023. this Form 10-K.

Factors Affecting Our Performance

Increasing Consumer Demand for Bandwidth. Bandwidth demand in all of our target markets is driving service provider investment in new equipment and in turn generating demand for our products. Increasingly, optical networking technologies are being incorporated into networking equipment, replacing legacy copper-based networking technologies. This shift to optical networking solutions benefits us as a provider of those solutions.

Pricing, Product Cost and Margins. Our products are sold in a highly competitive marketplace, and in many cases our products are only minimally differentiated from those of our competitors. In addition, our sales are heavily concentrated with a small number of end customers. As a result, there is strong pricing pressure across many of our product lines. We have addressed this strong pressure in several ways:

- Lowering our material costs. In some cases, we are able to negotiate more favorable pricing from our raw material suppliers. Also, where feasible, we are often able to develop internal production for certain materials that were previously purchased from other companies. This generally has resulted in lower material costs for us.
- Enhancing the efficiency of our production process. We have been able to automate many of our production processes, which often results in lower labor costs and reduced scrap or rework rates, both of which lower our production cost. In some cases, we have been able to redesign our products to make them less complex to manufacture, and when possible during these redesigns we also incorporate lower cost raw materials.
- Introducing new products. In many cases, newly released products have more features and often higher prices compared with older products. By regularly introducing new products, we attempt to minimize the average price reduction we experience. However, we often initially experience lower gross margins on new products, as our pricing is based upon anticipated volume-driven cost reductions over the life of the design win. Thus, if we are unable to realize our expected cost reductions, we may experience declining gross margins on such products.

Our product pricing is established when the product is initially introduced to the market, and thereafter through periodic negotiations with customers. We generally do not agree to periodic automatic price reductions. Furthermore, due to the dynamics in the CATV market and the value of our outsourced design services to our customers, we believe we face less downward price pressure than many of our competitors in this market. We sell a wide variety of products among our four target markets and our gross margin is heavily dependent in any quarter on the product mix achieved during that period as well as any price changes that we have agreed upon with our customers.

Customer Concentration within End Markets. Historically, our revenue has been significantly concentrated within the data center market, and starting from 2021, our revenue tends to be split primarily between CATV market and data center market. Moreover, within these markets, revenue tends to be concentrated among a small number of customers. In the last couple years, we have taken several actions to increase the diversity of our customer base. These actions include hiring additional sales staff to improve our ability to serve new customers and introduction of new products that we believe will appeal to new customers. Furthermore, we have developed additional original design manufacturer, or ODM, relationships with customers in each of our target markets which should enable us to diversify our revenue base. We had two three customers and three two customers that accounted for more than 10% of our revenue in 2022 2023 and 2021, 2022, respectively.

Product Development. We invest heavily to develop new and innovative products. The majority of our research and development expense is allocated to product development, usually with a specific customer and customer platform in mind. We believe our close coordination with our customers regarding their future product requirements enhances the efficiency of our research and development expenditures.

Discussion of Financial Performance

Revenue

We generate revenue through the sale of our products to equipment providers for the CATV, internet data center, CATV, telecom, FTTH and other markets. We derive a significant portion of our revenue from our top ten customers, and we anticipate that we will continue to do so for the foreseeable future. The following chart provides the revenue

contribution from each of the markets we serve for the years 2023, 2022 2021 and 2020 2021, as well as the corresponding percentage of our total revenue for each period (in thousands, except percentages):

Market	Years ended December 31,			Years ended December 31,		
	2022	2021	2020	2023	2022	2021
CATV	\$ 118,169	\$ 94,266	\$ 37,944	\$ 59,942	\$ 118,169	\$ 94,266
Data Center	77,094	97,461	173,437	141,213	77,094	97,461
Telecom	24,727	16,247	21,092	13,831	24,727	16,247
FTTH	129	957	110	56	129	957
Other	2,699	2,634	2,040	2,604	2,699	2,634
Total	\$ 222,818	\$ 211,565	\$ 234,623	\$ 217,646	\$ 222,818	\$ 211,565

	Percentage of Revenue			Percentage of Revenue		
CATV	53.0%	44.6%	16.2%	27.5%	53.0%	44.6%
Data Center	34.6%	46.1%	73.9%	64.9%	34.6%	46.1%
Telecom	11.1%	7.7%	9.0%	6.4%	11.1%	7.7%
FTTH	0.1%	0.5%	0.0%	0.0%	0.1%	0.5%
Other	1.2%	1.2%	0.9%	1.2%	1.2%	1.2%
Total Revenue	100%	100%	100%	100%	100%	100%

In 2023, 2022 2021 and 2020 2021, our top ten customers represented 87.2% 92.7%, 84.7% 87.2%, and 84.3% 84.7% of our revenue, respectively.

Revenue is recognized when obligations under the terms of a contract with our customer are satisfied; generally this occurs with the transfer of control of products or services. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring products or providing services. A majority of our annual sales are denominated in U.S. dollars, but some sales from our Taiwan location and China-based subsidiary are denominated in NT dollars and RMB, respectively. For the year ended December 31, 2022 2023, 23.0% 19.9% of our total revenue was manufactured at our China-based subsidiary, with \$10.5 \$3.8 million denominated in RMB and 73.7% 66% of our total revenue was from products manufactured at our Taiwan-based facility, with no revenue denominated in NT dollars. We expect a similar portion of our sales to be denominated in foreign currencies in 2023, 2024.

Cost of goods sold and gross margin

Our cost of goods sold is impacted by variances arising from changes in yields and production volume, as well as increases or decreases in the cost of raw materials used in production. We typically experience lower yields and higher associated costs on new products, especially during the initial phase of the production. For our mature products, we can experience lower yields and higher production costs if customer requirements change or if we experience manufacturing difficulties or quality issues during our production process. Notwithstanding the foregoing, however, in general for our mature products our cost of goods sold for a particular product declines over time as a result of increasing efficiencies in the manufacturing processes, or supply cost declines, as well as yield improvements and testing enhancements.

We manufacture products in three of our four facilities located in the U.S., Taiwan and China. Generally, laser chips and optical components are manufactured in our Sugar Land facility, and optical components, subassemblies and optical equipment are manufactured in our Taiwan and China facility. Because of our vertical integration model, we generally utilize our own optical component products in our semi-finished and finished goods that we sell between and among our respective manufacturing operations. We base those internal sales upon established transfer pricing methodologies. However, we eliminate all of those internal sales, and cost of goods sold transactions, to arrive at total revenue and cost of goods sold on a consolidated basis.

We have a global set of suppliers to help balance considerations related to product availability, quality and cost. Components of our cost of goods sold are denominated in U.S. or NT dollars or RMB, depending upon the manufacturing location.

Gross profit as a percentage of total revenue, or gross margin, has been and is expected to continue to be affected by a variety of factors, including the introduction of new products, production volumes, the mix of products sold, the geographic region in which products are sold, changes in the cost and volumes of materials purchased from our suppliers, changes in labor costs, changes in overhead costs, reserves for excess and obsolete inventories and changes in the average selling prices of our products. Although our overall gross margins over the past three years have been between 15.1% and 21.5% 27.1%, our gross margins vary more broadly on a product-by-product basis. Our newer and more advanced products typically have higher average selling prices and higher gross margins; however, until the product volumes scale, the gross margin from newer and advanced products may initially be lower. Within our markets, we may sell similar products to different geographic regions at different prices, and therefore realize different gross

margins among those similar products. Our strategy is to improve our gross margins through vertical integration such as utilization of our own laser chips and optical sub-components in our solutions. We expect that our gross margins are likely to continue to fluctuate from quarter to quarter because of the variety of products we sell and the relative product mix within a quarter.

Operating expenses

Our operating expenses consist of research and development, sales and marketing, and general and administrative expenses. Personnel costs are the most significant component of operating expenses and include salaries, benefits, bonuses and share-based compensation. With regard to sales and marketing expense, personnel costs also include sales commissions.

Research and development.

Research and development, or R&D, expense consists primarily of personnel costs, including share-based compensation for R&D personnel, and R&D work orders (that include material, direct labor and allocated overhead), as well as allocated development costs, such as engineering services, software and hardware tools, depreciation of capital equipment and facility costs. We record all research and development expense as incurred. Customers rely upon us to assist them with the development of new products and modification of existing products because of our extensive optical design and manufacturing expertise. We work closely with our customers in the critical design phase of product development and are occasionally reimbursed for some of these development efforts. We expect research and development expense to increase on a dollar basis, but will likely decrease as a percentage of our revenue to the extent that revenue increases over time.

Sales and marketing.

Sales and marketing expense consists primarily of personnel costs, including share-based compensation for our sales and marketing personnel, as well as travel and trade show **expense, expenses**, shipping and tariff **expense, expenses**, sales commissions and the allocation of overall corporate services and facility costs. We sell our products to customers who either incorporate our products into their **offering own products, use them in their own infrastructure**, or resell our products to end customers. Because we sell to a limited number of well-established customers, we employ a limited number of sales professionals who are able to cover large markets. We compensate our sales staff through base salary and commissions, with base salary being the largest component of overall compensation. Total sales commissions to employees amounted to less than one percent of our revenue in **2023, 2022 2021 and 2020 2021**. Additionally, we pay commissions to third parties on certain product lines and identified customers, which also amounted to less than one percent of our revenue in **2023, 2022 2021 and 2020 2021**. As such, our sales and marketing expense does not directly increase with revenue. In the future, we expect sales and marketing expense to increase on a dollar basis as we incrementally increase our overall sales activities, but expect our sales and marketing expense to decline as a percentage of revenue, to the extent our revenue increases over time.

General and administrative.

General and administrative expense consists primarily of personnel costs, including share-based compensation, primarily for our finance, human resources, legal and information technology personnel and certain executive officers, as well as professional services costs related to accounting, tax, banking, legal and information technology services, depreciation of capital equipment and facility costs. We expect general and administrative expense to increase as we continue to grow in both size and complexity as a public company. We expect rising costs including increased audit and legal fees, costs to comply with rules and regulations applicable to companies listed on a national stock exchange, as well as investor relations expense and higher insurance premiums. In the future, we expect general and administrative expense to increase on a dollar basis but to decline as a percentage of revenue, to the extent that our revenue increases over time.

Other income (expense)

Interest income consists of income earned on our cash, cash equivalents and short-term investments. Interest expense consists of amounts paid for interest on our short-term and long-term debt borrowings, and convertible senior notes.

Other income (expense), net is primarily made up of government subsidized income, extinguishment of debt and foreign currency transaction gains and losses. The functional currency of our China subsidiary is the RMB and the foreign currency transaction gains and losses of our China subsidiary primarily result from their transactions in U.S. dollars. The functional currency of our Taiwan location is the NT dollar and the foreign currency transaction gains and losses of our Taiwan location primarily result from their transactions in U.S. dollars.

Income taxes

We are a U.S. registered company and are subject to income taxes in the U.S. We also operate in a number of countries throughout the world, including Taiwan and China. Consequently, our effective tax rate is impacted by the geographic distribution of our earnings or losses and the tax laws and regulations in each geographical region. We expect

that our income taxes will vary in relation to our profitability and the geographic distribution of our profits. In 2023, 2022 and 2021 our effective tax rate was (0.0%). In 2020 our effective tax rate was (14.1%) 0%.

Our wholly owned subsidiary, Global Technology, Inc., has received preferential tax concessions in China as a national high-tech enterprise. In March 2007, China's parliament enacted the PRC Enterprise Income Tax Law, or the EIT Law, under which, effective January 1, 2008, China adopted a uniform income tax rate of 25% for all enterprises including foreign invested enterprises. Global was recognized as a national high-tech enterprise in 2008 and was entitled to a 15% tax rate for a three-year period. Global renewed its national high-tech enterprise certificate in 2011, 2014, 2017, 2020, and 2020, 2023 extending its three-year tax preferential status through December 2023, 2026.

For the years ended December 31, 2022 December 31, 2023 and 2021, 2022, we had \$0.2 million \$0.2 million and \$0.2 million, respectively, of unrecognized tax benefits related to U.S. tax benefits recognized for which we do not meet the more likely than not threshold.

See additional information regarding income taxes in Note O, included in Part II, Item 8 of this Form 10-K.

Seasonality

We are uncertain whether the demand for our CATV, internet data center, CATV, telecom and FTTH products is seasonal, as our sales data does not indicate a significant trend with respect to these products. We began to manufacture a meaningful quantity of CATV and internet data center products in our Ningbo, China factory in 2017 and 2020, respectively. This factory experiences a lengthy shut-down associated with the Lunar New Year holiday which occurs in Q1 of each year. In addition to the factory shut-down, it is also common for employees in the factory to fail to return to work following resumption of operations. In the years 2022 2023, 2021 2022, and 2020 2021, the percentage of employees in our China factory who resigned or were terminated during Q1, relative to the average number of employees during the quarter was 66.1% 53.8%, 35.9% 66.1%, and 43.8% 35.9%, respectively. We believe that the turnover in 2020 2022 was higher than usual due to the COVID-19 pandemic which caused travel restrictions, additional health check requirements, and a lengthy shutdown of operations in Ningbo. As a result of employee turnover, we must hire and train replacement employees. These replacement employees require a period of training and improvement, and this impacts the quantity of products we can produce in the quarter. The combined effect of the factory shut-down and employee turnover in the quarter may also contribute to negative seasonality in Q1.

Our gross margin varies quarter to quarter and varies primarily due to the product mix in a particular quarter, as well as from the level of manufacturing efficiencies, production yields (particularly in the laser chip fabrication process) and overall supply costs.

Results of Operations

The following table sets forth our results of operations for the periods presented as a percentage of our revenue for those periods. The period-to-period comparison of our financial results is not necessarily indicative of our financial results to be achieved in future periods.

	Years ended December 31,			Years ended December 31,		
	2022	2021	2020	2023	2022	2021
Revenue, net	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Cost of goods sold	84.9 %	82.2 %	78.5 %	72.9 %	84.9 %	82.2 %
Gross profit	15.1 %	17.8 %	21.5 %	27.1 %	15.1 %	17.8 %
Operating expenses						
Research and development	16.3 %	19.5 %	18.5 %	16.5 %	16.3 %	19.5 %
Sales and marketing	4.4 %	5.2 %	6.0 %	5.1 %	4.4 %	5.2 %
General and administrative	20.9 %	20.0 %	17.9 %	24.5 %	20.9 %	20.0 %
Total operating expenses	41.6 %	44.7 %	42.4 %	46.1 %	41.6 %	44.7 %
Loss from operations	(26.5) %	(26.8) %	(20.8) %	(19.0) %	(26.5) %	(26.8) %
Interest and other expense, net	(3.3) %	1.2 %	(1.0) %	(6.7) %	(3.3) %	1.2 %
Loss before income taxes	(29.8) %	(25.6) %	(21.8) %	(25.7) %	(29.8) %	(25.6) %
Income tax expense	(0.0) %	0.0 %	(3.1) %	0.0 %	0.0 %	0.0 %
Net loss	(29.8) %	(25.6) %	(24.9) %	(25.7) %	(29.8) %	(25.6) %

Comparison of Years Ended December 31, 2022 2023 and 2021 2022

Revenue

We generate revenue through the sale of our products to equipment providers and network operators for the CATV, internet data center, CATV, telecom, FTTH and other markets. We derive a significant portion of our revenue from our top ten customers, and we anticipate that we will continue to do so for the foreseeable future. The following charts provide the revenue contribution from each of the markets we served for the years ended December 31, 2022 2023 and 2021 2022 (in thousands, except percentages):

	Years ended December 31,						Years ended December 31,					
	2022		2021		Change		2023		2022		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%	Amount	% of Revenue	Amount	% of Revenue	Amount	%
CATV	\$ 118,169	53.0%	\$ 94,266	44.6%	\$ 23,903	25.4%	\$ 59,942	27.5%	\$ 118,169	53.0%	\$ (58,227)	(49.3)%
Data Center	77,094	34.6%	97,461	46.1%	(20,367)	(20.9)%	141,213	64.9%	77,094	34.6%	64,119	83.2%
Telecom	24,727	11.1%	16,247	7.7%	8,480	52.2%	13,831	6.4%	24,727	11.1%	(10,896)	(44.1)%
FTTH	129	0.1%	957	0.5%	(828)	(86.5)%	56	0.0%	129	0.1%	(73)	(56.6)%
Other	2,699	1.2%	2,634	1.2%	65	2.5%	2,604	1.2%	2,699	1.2%	(95)	(3.5)%
Total Revenue	\$ 222,818	100.0%	\$ 211,565	100.0%	\$ 11,253	5.3%	\$ 217,646	100.0%	\$ 222,818	100.0%	\$ (5,172)	(2.3)%

Revenue increased decreased by \$11.2 million \$5.2 million or 5.3% 2.3% from 2021 2022 to 2022. 2023. The increase decrease was driven primarily by strong decreased demand in the CATV product sales market, which we believe is due to reductions in purchasing of older generation DOCSIS 3.1 equipment, which was nearly offset by increased demand for our internet datacenter products, arising from demand for products necessary for new datacenter construction along with architecture improvements datacenter upgrades to enable delivery of additional bandwidth to consumers. The increase in bandwidth demand was particularly acute in the upstream direction, and sales of products associated with increased return-path bandwidth were notably strong in the year. The increase was offset by the decrease of data center sales related to inventory normalization and demand decrease. new technologies like Artificial Intelligence (AI). Based on customer forecasts and order backlog we believe that this elevated CATV datacenter demand will likely continue into 2023. 2024. We also believe that sales in our CATV market will increase in 2024 as a result of DOCSIS 4.0 products which we plan to release in 2024.

In the years ended December 31, 2022 2023 and 2021 2022, our top ten customers represented 87.2% 92.7% and 84.7% 87.2% of our revenue, respectively. We believe that diversifying our customer base is critical for our future success, since reliance on a small number of key customers makes our ability to forecast future results dependent upon the accuracy of the forecasts we receive from those key customers.

Cost of goods sold and gross margin

	Years ended December 31,						Years ended December 31,					
	2022		2021		Change		2023		2022		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%	Amount	% of Revenue	Amount	% of Revenue	Amount	%
(in thousands, except percentages)												
Cost of goods sold	\$ 189,191	84.91%	\$ 173,850	82.17%	\$ 15,341	8.8%	\$ 158,725	72.9%	\$ 189,191	84.9%	\$ (30,466)	(16.1)%
Gross margin	33,627	15.09%	37,715	17.83%	(4,088)	(10.8)%	58,921	27.1%	33,627	15.1%	25,294	75.2%

Cost of goods sold increased decreased by \$15.3 \$30.5 million, or 8.8% 16.1%, from 2021 2022 to 2022 2023, primarily due to a 5.3% 24% decrease from direct material costs. The increase in sales over the prior year. The decrease in gross margin for the year ended December 31, 2022 2023 compared to the same period ended December 31, 2021 2022 was primarily the result of our change in business strategy from selling non-branded products through channel partners to selling branded products directly to MSOs in our CATV segment, along with some price increases and changes in the mix of products in our CATV datacenter segment and new sales to Microsoft for non-recurring engineering ("NRE") costs associated with product development projects for their next-generation datacenter segments. In addition, we also experienced higher costs of certain raw materials and global supply chain disruptions due to COVID-19 closures of ports and factories in Asia (see the section above on the COVID-19 pandemic for more details of these challenges). optics.

Operating expenses

Years ended December 31,						Years ended December 31,					
2022		2021		Change		2023		2022		Change	
Amount	% of revenue	Amount	% of revenue	Amount	%	Amount	% of revenue	Amount	% of revenue	Amount	%

	(in thousands, except percentages)						(in thousands, except percentages)					
Research and development	\$ 36,244	16.3%	\$ 41,220	19.5%	\$ (4,976)	(12.1)%	\$ 35,975	16.5%	\$ 36,244	16.3%	\$ (269)	(0.7)%
Sales and marketing	9,723	4.4%	10,899	5.2%	(1,176)	(10.8)%	11,069	5.1%	9,723	4.4%	1,346	13.8%
General and administrative	46,658	20.9%	42,362	20.0%	4,296	10.1%	53,226	24.5%	46,658	20.9%	6,568	14.1%
Total operating expenses	\$ 92,625	41.6%	\$ 94,481	44.7%	\$ (1,856)	(2.0)%	\$ 100,270	46.1%	\$ 92,625	41.6%	\$ 7,645	8.3%

Research and development expense

Research and development expense decreased \$5.0 million, \$0.27 million, or 12.1% 0.7% from 2021 2022 to 2022 2023. Research and development costs consist of R&D work orders, R&D material usage and other project related costs related to 100 Gbps, 200/400 Gbps data center products, DOCSIS 3.1 4.0 capable CATV products, including remote-PHY products and 1.2 1.8 GHz-capable amplifier products, and other new product development, and depreciation expense resulting from R&D equipment investments. The These decreases were primarily due to less R&D work orders, renovation less depreciation ended in October 2021 in China site expense and less indirect materials usage, offset by higher R&D wage expenses due to a combination of increased headcount and salary increases.

Sales and marketing expense

Sales and marketing expense decreased increased by \$1.2 million, \$1.3 million, or 10.8% 13.8%, from 2021 2022 to 2022 2023. These decreases increases were primarily due to the less more sales from certain customers which include commission incentives, and partially effort for our Quantum Bandwidth™ products, offset by an increase less commission expense in tradeshow expenses in 2022 due to the increase in number of tradeshow attended because of less COVID-19 restrictions, China.

General and administrative expense

General and administrative expense increased by \$4.3 \$6.6 million, or 10.1% 14.1%, from 2021 2022 to 2022 2023. These increases were primarily due to the idle asset allocation from production to general higher professional service fees and administrative section and additional bonus share-based compensation expense, in 2022 for meeting the target, offset by less depreciation expense.

Other income (expense), net

	Years ended December 31,						Years ended December 31,					
	2022		2021		Change		2023		2022		Change	
	Amount	% of revenue	Amount	% of revenue	Amount	%	Amount	% of revenue	Amount	% of revenue	Amount	%
	(in thousands, except percentages)						(in thousands, except percentages)					
Interest income	\$ 126	0.1%	\$ 70	0.0%	\$ 56	80.0%	\$ 609	0.3%	\$ 126	0.1%	\$ 483	383.3%
Interest expense	(6,319)	(2.8)%	(5,620)	(2.7)%	(699)	12.4%	(9,428)	(4.3)%	(6,319)	(2.8)%	(3,109)	49.2%
Other income (expense), net	(1,205)	(0.5)%	8,156	3.9%	(9,361)	(114.8)%	(5,871)	(2.7)%	(1,205)	(0.5)%	(4,666)	387.2%
Total other income (expense), net	\$ (7,398)	(3.3)%	\$ 2,606	1.2%	\$ (10,004)	(383.9)%	\$ (14,690)	(6.7)%	\$ (7,398)	(3.2)%	\$ (7,292)	98.6%

Interest income increased by \$0.1 million, \$0.5 million, or 80.0% 383.3% from 2021 2022 to 2022 2023. The changes are similar increase was primarily due to expected rates of fluctuation higher savings balance and higher savings rate in 2023, compared with the interest rates and cash balances, 2022.

Interest expense increased by \$0.7 million, \$3.1 million, or 12.4% 49.2% from 2021 2022 to 2022 2023. The increase was primarily due to the debt balance increase higher interest rates in 2023, and termination of the interest rate fluctuation during the year. CIT loan agreement in November, 2023.

Other income decreased expense increased by \$9.4 \$4.7 million, or 114.8% 387.2% from 2021 2022 to 2022 2023. This decrease. This increase was primarily due to the \$6.23 million government's PPP Loan forgiveness stimulus obtained in year 2021. The remaining decrease was mainly due debt extinguishment cost relating to the foreign exchange loss, 2024 Notes, which is non cash expense related to issuance of shares.

Benefit (provision) for income taxes

	Years ended December 31,			
	2022	2021	Change	
	(in thousands, except percentages)			
Benefit (provision) for income taxes	\$ (1)	\$ (2)	1	(50.0)%

	Years ended December 31,			
	2023	2022	Change	
	(in thousands, except percentages)			
Benefit (provision) for income taxes	\$ (9)	\$ (1)	(8)	800.0 %

Our income tax provision consists of U.S. income tax, state taxes, and Taiwan and China income tax recorded during the periods. Our effective tax rate is affected by recurring items, such as tax rates in state and foreign jurisdictions and the relative amounts of income we earn in those jurisdictions.

We recorded no federal tax expense for the years ended [December 31, 2022](#) [December 31, 2023](#) and [December 31, 2021](#) [December 31, 2022](#). The income tax expense in the years ended [December 31, 2022](#) [December 31, 2023](#) and [December 31, 2021](#) [December 31, 2022](#) was primarily related to the state tax provision and the recording of a valuation allowance on our deferred tax assets.

Liquidity and Capital Resources

As of December 31, [2022](#) [2023](#), we had [\\$13.3](#) [\\$22.5](#) million of unused borrowing capacity from all of our loan agreements. As of December 31, [2022](#) [2023](#), our cash, cash equivalents, restricted cash and short-term investments totaled [\\$35.6](#) [\\$55.1](#) million. Cash and cash equivalents are held for working capital purposes and are invested primarily in money market or time deposit funds.

ATM Offerings

On [October 24, 2019](#) [January 5, 2023](#), we the Company filed a Registration Statement on Form S-3 with the Securities and Exchange Commission, which was declared effective on [January 9, 2020](#) [March 21, 2023](#), providing for the public offer and sale of certain securities of the Company from time to time, at our discretion, up to an aggregate amount of [\\$250 million](#) [\\$185 million](#). Pursuant to Rule 415(a)(6) under the Securities Act, the securities registered pursuant to this registration statement include unsold securities previously registered for sale pursuant to our previously filed Registration Statement on Form S-3, which became effective on [January 9, 2020](#).

On [February 28, 2020](#) [March 24, 2023](#), we entered into an Equity Distribution Agreement (the "Agreement") with Raymond James & Associates Inc. (the "Sales Agent" "Sales Agent") pursuant to which the Company may issue and sell shares of the Company's common stock having an aggregate offering price of up to \$55 million (the "Initial ATM Offering"), from time to time through the Sales Agent. In January 2021, the Company completed its Initial ATM Offering and sold 5.9 million shares at a weighted average price of \$9.12 per share, providing proceeds of \$53.9 million, net of expenses and underwriting discounts and commissions.

On February 26, 2021, we entered into another Equity Distribution Agreement (the "Agreement") with the Sales Agent pursuant to which the Company may issue and sell shares of the Company's common stock, par value \$0.001 per share (the "Shares" "Shares") having an aggregate offering price of up to \$35 million (the "Second ATM Offering" "ATM Offering"), from time to time through the Sales Agent. Upon delivery of a placement notice and subject to the terms and conditions of the Agreement, sales, if any, of the Shares will be made through the Sales Agent in transactions that are deemed to be "at the market" offerings as defined in Rule 415 of the Securities Act of 1933, as amended (the "Securities Act" "Securities Act"), including sales made through the facilities of the Nasdaq Global Market, the principal trading market for the Company's common stock, on any other existing trading market for the Company's common stock, to or through a market maker or as otherwise agreed by the Company and the Sales Agent. In the placement notice, the Company will designate the maximum number of Shares to be sold through the Sales Agent, the time period during which sales are requested to be made, the minimum price for the Shares to be sold, and any limitation on the number of Shares that may be sold in any one day. Subject to the terms and conditions of the Agreement, the Sales Agent will use its commercially reasonable efforts to sell Shares on the Company's behalf up to the designated amount specified in the placement notice. The Company has no obligation to sell any Shares under the Agreement and may at any time suspend offers and sales of the Shares under the Agreement.

The Agreement provides that the Sales Agent will be entitled to compensation of up to 2% of the gross sales price of the Shares sold through the Sales Agent from time to time. The Company has also agreed to reimburse the Sales Agent for certain specified expenses in connection with the registration of Shares under state blue sky laws and any filing with, and clearance of the offering by, the Financial Industry Regulatory Authority Inc., not to exceed \$10,000 in the aggregate, and any associated application fees incurred. Additionally, if the Agreement is terminated under certain circumstances, and the Company fails to sell a minimum amount of the Shares as set forth in the Agreement, then the Company has agreed to reimburse the Sales Agent for reasonable out-of-pocket expenses, including the reasonable fees and disbursements of counsel incurred by the Sales Agent, up to a maximum of \$30,000 in the aggregate. The Company agreed to indemnify the Sales Agent against certain liabilities, including liabilities under the Securities Act, or to contribute to payments that the Sales Agent may be required to make because of any of those liabilities.

On September 12, 2023, we entered into Amendment No. 1 to the Agreement with the Sales Agent, to increase the aggregate offering price from \$35 million to \$70 million. In March 2021, November, 2023, we commenced completed sales of common stock through under the Second ATM Offering.

The details of the shares of common stock sold through the Second ATM Offering through December 31, 2022 December 31, 2023 are as follows (in thousands, except shares and weighted average per share price):

Distribution Agent	Month	Weighted Average Per Share Price	Number of Shares Sold	Net Proceeds	Compensation to Distribution Agent	Month	Weighted Average Per Share Price	Number of Shares Sold	Net Proceeds	Compensation to Distribution Agent
Raymond James & Associates, Inc.	March 2021	9.0622	65,748	\$ 584	12	Feb 2023	\$ 2.811	158	\$ 436	\$ 9
Raymond James & Associates, Inc.	June 2021	9.1115	34,686	310	6	Jun 2023	4.036	2,497	9,879	202
Raymond James & Associates, Inc.	July 2021	9.1061	6,740	60	1	Aug 2023	11.645	1,150	13,124	268
Raymond James & Associates, Inc.	September 2022	2.9045	94,491	269	5	Sept 2023	10.184	892	8,901	182
Raymond James & Associates, Inc.	October 2022	2.8947	313,333	889	18	Oct 2023	11.003	1,043	11,244	229
Raymond James & Associates, Inc.	November 2022	2.7830	29,426	80	2	Nov 2023	12.572	2,068	25,473	520
Total			544,424	\$ 2,192	44	Total		7,808	\$ 69,057	\$ 1,410

As of December 31, 2022, the total gross sales were \$2.2 million and thus remaining amount of common stock we have available to sell under the Second ATM Note Offering is \$32.8 million.

On January 5, 2023, the Company filed a Registration Statement on Form S-3 with the Securities and Exchange Commission, which has not yet been declared effective, providing for the public offer and sale of certain securities of the Company from time to time, at our discretion, up to an aggregate amount of \$185 million. Pursuant to Rule 415(a)(6) under the Securities Act, the securities registered pursuant to this registration statement include unsold securities previously registered for sale pursuant to our previously filed registration statement on Form S-3, which became effective on January 9, 2020.

On March 5, 2019, the Company issued \$80.5 million of 5% convertible senior notes due 2024, bearing interest at a rate of 5% per year maturing on March 15, 2024 (the "Notes" "2024 Notes"), unless earlier repurchased, redeemed or converted in accordance with their terms. The sale

On December 5, 2023, the Company issued approximately \$80.2 million aggregate principal amount of 5.250% convertible senior notes due 2026 (the "2026 Notes"), and on the same day consummated various separate, privately negotiated exchange agreements with certain holders of its 2024 Notes to exchange or repurchase approximately \$80.2 million principal amount of the 2024 Notes generated net proceeds for aggregate consideration consisting of \$76.4 million, after expenses. approximately \$81.1 million in cash, which included accrued interest on the 2024 Notes, and approximately 466,368 shares of the Company's common stock, par value \$0.001 per share. Also refer to Note L "Convertible Senior Notes" to the consolidated financial statements for further discussion of the 2026 Notes.

The table below sets forth selected cash flow data for the periods presented (in thousands):

	Years ended December 31,			Years ended December 31,		
	2022	2021	2020	2023	2022	2021
Net cash used in operating activities	\$ (14,022)	\$ (11,644)	\$ (44,009)	\$ (7,929)	\$ (14,022)	\$ (11,644)
Net cash used in investing activities	(3,834)	(10,546)	(19,347)	(14,761)	(3,834)	(10,546)
Net cash provided by financing activities	10,753	14,087	47,441	40,578	10,753	14,087
Effect of exchange rates on cash and cash equivalents	1,553	(876)	(999)	1,622	1,553	(876)
Net decrease in cash	\$ (5,550)	\$ (8,979)	\$ (16,914)			
Net increase(decrease) in cash				\$ 19,510	\$ (5,550)	\$ (8,979)

Operating activities

In 2023, net cash used in operating activities was \$7.9 million. Net cash used in operating activities consisted of our net loss of \$56.0 million, after the exclusion of non-cash items of \$42.1 million, a decrease in accounts receivable from our customers of \$14.5 million and a decrease in our inventory of \$6.8 million, contributing to the cash increases.

These cash increases were offset by a decrease in accounts payable of \$15.0 million and a decrease in unearned revenue of \$2.5 million.

In 2022, net cash used in operating activities was \$14.0 million. Net cash used in operating activities consisted of our net loss of \$66.4 million, after the exclusion of non-cash items of \$40.5 million, an increase in accounts receivable from our customers of \$12.7 million and an increase in other current assets of \$2.4 million. These cash decreases were offset by a decrease of notes receivable of \$7.8 million, decrease in inventory of \$1.2 million, increase in accounts payable to our vendors of \$13.0 million and increase in accrued liabilities liability of \$5.3 million.

In 2021, net cash used in operating activities was \$11.6 million. Net cash used in operating activities consisted of our net loss of \$54.2 million, after the exclusion of non-cash items of \$36.6 million, an increase in accounts and notes receivable from our customers of \$14.6 million and a decrease in accrued liabilities of \$3.1 million. These cash decreases were offset by a decrease in inventory of \$15.8 million and increase in accounts payable to our vendors of \$7.1 million.

In 2020, net cash used in operating activities was \$44.0 million. Net cash used in operating activities consisted of our net loss of \$58.5 million, after the exclusion of non-cash items of \$48.9 million, an increase in accounts receivable from our customers of \$8.4 million and an increase in inventory of \$23.7 million and decrease in accounts payable to our vendor of \$3.3 million.

Investing activities

Our investing activities consisted primarily of capital expenditures and purchases of intangible assets.

In 2023, net cash used in investing activities was \$14.8 million. The majority of the cash was used for CapEx spending of \$14.3 million.

In 2022, net cash used in investing activities was \$3.8 million. The net cash used consisted of spending on purchase and prepaid of additional property, plant and equipment of \$3.7 million and purchase of intangible assets of \$0.5 million.

In 2021, net cash used in investing activities was \$10.5 million. The net cash used consisted of spending on purchase and prepaid of additional property, plant and equipment of \$10.2 million.

In 2020, net cash used in investing activities was \$19.3 million. The net cash used consisted of spending on China factory construction, purchase and prepaid of additional property, plant and equipment of \$19.1 million.

Financing activities

Our financing activities have historically consisted primarily of proceeds from the issuance of common stock and arrangements with various commercial lenders.

In 2023, our financing activities provided \$40.6 million in cash. This increase in cash was primarily due to \$69.0 million of net proceeds from our ATM Offering, \$76.1 million from the 2026 Notes, offset by the repayment of 2024 Notes amounting to \$80.2 million and repayment of line of credit borrowings of \$34.2 million.

In 2022, our financing activities provided \$10.8 million in cash. This increase in cash was due to \$12.2 million of net proceeds from line of credit borrowing, \$5.1 million of net proceeds from bank acceptance payable and \$1.2 million of net proceeds from our At-The-Market (ATM) ATM Offering. These activities were offset by \$7.3 million debt repayment and \$0.5 million related to tax withholding associated with employee share-based compensation.

In 2021, our financing activities provided \$14.1 million in cash. This increase in cash was due to \$15.4 million of net proceeds from our At-The-Market (ATM) ATM Offering. These activities were offset by \$0.3 million net repayments to acceptances payable and bank debt, and \$1.0 million related to tax withholding associated with employee share-based compensation.

In 2020, our financing activities provided \$47.4 million in cash. This increase in cash was due to \$39.2 million of net proceeds from our At-The-Market (ATM) Offering, \$6.2 million proceeds from PPP term loan, and \$3.4 million net proceeds from acceptances payable and bank debt.

Loans and commitments

We have lending arrangements with several financial institutions. In the U.S., we entered a Loan Security and Guarantee Agreement with CIT Northbridge Credit, LLC in November 2022 and fully repaid the loan with Truist Bank. 2022. The line of credit contains contained financial covenants that may limit the amount and types of debt that we may incur. As of December 31, 2022, In November 2023, we were in compliance terminated the loan agreement with these covenants. CIT Northbridge Credit, LLC.

In Taiwan, the Company has fully repaid the finance agreement with Chailease Finance Co, Ltd. for Prime World's Taiwan Branch. In China, we have a revolving line of credit with Shanghai Pudong Development Bank Co., Ltd and a credit facility with China Zheshang Bank Co., Ltd. for our China subsidiary, Global.

As of December 31, 2022 2023 , we had \$13.3 \$22.5 million of unused borrowing capacity.

On ~~March 5, 2019~~ December 5, 2023, the Company issued ~~\$80.5 million~~ \$80.2 million of 5% 5.250% convertible senior notes due ~~2024, 2026~~. The 2026 Notes will mature on ~~March 15, 2024~~ December 15, 2026, unless earlier repurchased, redeemed or converted in accordance with their terms.

See Note K "Notes Payable and Long-term Debt" and Note L "Convertible Senior Notes" of our Consolidated Financial Statements for a description of our notes payable and long-term debt and convertible senior notes.

China factory construction

On February 8, 2018, we entered into a construction contract with Zhejiang Xinyu Construction Group Co., Ltd. for the construction of a new factory and other facilities at our Ningbo, China location. Construction costs for these facilities under this contract are estimated to total approximately \$27.5 million. As of ~~December 31, 2022~~ December 31, 2023, construction of the building shell is complete, and approximately \$27.4 million of this total cost has been paid and the remaining portion will be paid in yearly installments for three years after final inspection. We anticipate additional expenses for building improvements to the factory and we are in the process of evaluating the timing of these expenditures and obtaining bids for any such work. Based on forecasts, we believe the factory will be placed in service in the second half of ~~2023~~ 2024 after the construction is completed for the building interior. Property will be transferred from construction in progress to building and improvement at that time.

Future liquidity needs

We believe that our existing cash and cash equivalents, cash flows from our operating activities, and available credit will be sufficient to meet our anticipated cash needs for the next 12 months. Our future capital requirements will depend on many factors including our growth rate, the timing and extent of spending to support our research and development efforts, the expansion of our sales and marketing activities, the introduction of new and enhanced products, changes in our manufacturing capacity and the continuing market acceptance of our products. In the event we need additional liquidity, we will explore additional sources of liquidity. These additional sources of liquidity could include one, or a combination, of the following: (i) issuing equity or debt securities, (ii) incurring indebtedness secured by our assets and (iii) selling product lines, other assets and/or portions of our business. There can be no guarantee that we will be able to raise additional funds on terms acceptable to us, or at all.

Contractual Obligations and Commitments

We have outstanding notes payable with varying maturities. As of ~~December 31, 2022~~ December 31, 2023, our notes payable had an amount of ~~\$57.1 million, \$23.2 million~~, and the entire balance is due within 12 months. Further information regarding our ~~note~~ notes payable is provided in Note K Notes Payable and Long-Term Debt in the Notes to Consolidated Financial Statements in this Form 10-K. We also have a fixed-rate convertible senior note. As of ~~December 31, 2022~~ December 31, 2023, our ~~convertible senior note~~ 2026 Note had an aggregate principle amount of ~~\$80.5 million~~ \$80.2 million and future interest payments associated with our ~~senior notes~~ 2026 Notes totaled ~~\$6.0 million, \$12.6 million~~. Further information regarding our convertible senior notes is provided in Note L – Convertible Senior Notes in the Notes to Consolidated Financial Statements in this Form 10-K. In addition, we have operating and ~~financial lease~~ financing leases for certain property and equipment with an expected term at the commencement date of more than 12 months. As of ~~December 31, 2022~~ December 31, 2023, the future minimum payments required under these leases totaled ~~\$7.3~~ \$6.4 million, with ~~\$1.2~~ \$1.3 million payable within 12 months. Further information regarding our leases is provided in Note D – Leases to Consolidated Financial Statements in this Form 10-K.

Inflation

The annual inflation rate in the US ~~and came down to 3.4% in 2023. Even though the inflation has slowed from the peak, it remained well above the Federal Reserve's objective of 2%. The annual inflation rate in Taiwan accelerated more than 7% came down to 2.7% in 2021 and closed out at 6.5% and 2.71% 2023 from 2.95% in December 2022 for US and Taiwan, respectively, 2022.~~ The cost of inflation was reflected in increases in shipping costs, labor rates, and in costs of some raw ~~materials; we materials. We believe these increases decreases are related to the COVID-19 pandemic (please refer to our discussion on COVID-19 in supply chain pressure easing and decreasing commodity prices, however the MD&A section of this Form 10-K), however we labor market is still tight, and the wage pressure is still high. We cannot be sure when or if prices will return to pre-pandemic levels. Compared to other major economies in the world, China has a stable level of inflation, which has not had a significant impact on our sales or operating results. However, there is no guarantee that we may increase selling prices or reduce costs to fully mitigate the effect of inflation on our costs, which may adversely impact our sales margins and profitability.~~

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements, which have been prepared in accordance with U.S. GAAP. These principles require us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, expenses and cash flows, and related disclosure of contingent assets and liabilities. Our estimates include those related to revenue recognition, share-based compensation expense, impairment analysis of goodwill and long-lived assets, valuation of inventory, warranty liabilities and accounting for income taxes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. Actual results may differ from these estimates. To the extent that there are material differences between these estimates and our actual results, our future financial statements will be affected.

We believe that of our significant accounting policies, which are described in Note B to our consolidated financial statements appearing elsewhere in this Form 10-K, the following accounting policies involve a greater degree of judgment and complexity. Accordingly, we believe these are the most critical to fully understand and evaluate our financial condition and results of operations.

Long-lived assets

We evaluate the carrying value of long-lived assets for potential impairment when we determine a triggering event has occurred, or whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. When indicators exist, recoverability of assets is measured by a comparison of the carrying value of the asset group to the estimated undiscounted future net cash flows expected to be generated by the **asset, asset group**. Examples of such triggering events include a significant disposal of a portion of such assets, an adverse change in the market involving the business employing the related asset, a significant decrease in the benefits realized from an acquired business, difficulties or delays in integrating the business, and a significant change in the operations of an acquired business. If such assets are determined not to be recoverable we perform an analysis of the fair value of the asset group and will recognize an impairment loss when the fair value is less than the carrying amount of such assets. The fair value, based on reasonable and supportable assumptions and projections, require subjective **judgments, judgments including meaningful asset grouping, expectations for future revenue, and disposal value for the asset(s)**. Depending on the assumptions and estimates used, the fair value projected in the evaluation of long-lived assets can vary within a range of outcomes. We consider the likelihood of possible outcomes in determining the best estimate for the fair value of the assets. We did not record any asset impairment charges in **2023, 2022 2021 and 2020, 2021**.

Valuation of inventories

Inventories are stated at the lower of cost (average-cost method) or net realizable value. Work in process and finished goods includes materials, labor and allocated overhead. We assess the valuation of our inventory on a periodic basis and provide an allowance for the value of estimated excess and obsolete inventory based on estimates of future demand. Inventory reserves are recorded to account for the excess and obsolete inventory combined with the lower of cost or net realizable value assessments. To develop the reserve, we developed certain percentages that determine the extent of inventory reserve adjustments based on the age of the inventory. Such percentages were determined through analysis of the inventory to determine each product's lifespan, a review of historical write-offs or scrapped inventory, and an assessment by product engineers of the possibility of obsolescence for each product.

During the years ended **December 31, 2022 December 31, 2023, 2021 2022 and 2020, 2021**, we recorded excess and obsolete inventory reserve charges of **\$4.9 \$8.7 million, \$3.9 million \$4.9 million, and \$3.9 million, respectively**. For the years **December 2022, 2021 December 2023, 2022 and 2020, 2021**, the direct inventory write-offs related to scrap, discontinued products and damaged inventories were **\$10.6 million, \$10.4 million, and \$16.8 million, and \$20.4 million, respectively**.

We have an accounting policy to record a reserve for inventory encompassing the value of excess or obsolete items combined with the lower of cost or net reliable value. We considered the following factors in our determination of the appropriate reserve level: how often we buy material in bulk; the overall market value of raw material, semi-finished goods and finished goods across our varied product lines and within markets; changes in expected demand for our products; the change in valuations historically; the determined safety stock for key customers; and the likelihood of postponement in delivery schedules for materials already placed in finished goods inventory. **We consider these factors to be subjective because there can be no certainty that past trends will continue and our future expectations cannot be known with certainty. If past trends in demand, for example, change, then this could materially change the values used in our estimates.**

Accounting for income taxes

We account for income taxes in accordance with the provisions of ASC 740, *Income Taxes*. The liability method is used to account for deferred income taxes. Under the liability method, deferred tax assets and liabilities are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The ability to realize deferred tax assets is evaluated annually and a valuation allowance is provided if it is unlikely that the deferred tax assets will not give rise to future benefits in our tax returns.

On the basis of this evaluation, as of **December 31, 2022 December 31, 2023**, a valuation allowance of **\$69.7 million \$78.1 million** has been recorded related to deferred tax assets to recognize only the portion of the deferred tax assets that are more likely than not to be realized. The amount of the deferred tax assets considered realizable, however, could be adjusted if estimates of future taxable income during the carryforward period are reduced or increased or if objective negative evidence in the form of cumulative losses is no longer present and additional weight is given to subjective evidence such as our projections for growth.

We record uncertain tax positions in accordance with ASC 740 on the basis of a two-step process in which (1) we determine whether it is more likely than not that the tax positions will be sustained on the basis of the technical merits of the position and (2) for those tax positions that meet the more-likely-than-not recognition threshold, we recognize the largest amount of tax benefit that is more than 50% likely to be realized upon ultimate settlement with the related tax authority.

We recognize interest and penalties related to unrecognized tax benefits on the income tax expense line in the accompanying consolidated statement of operations. Accrued interest and penalties are included on the related tax liability line in the consolidated balance sheet.

See additional information regarding income taxes in Note O of our Consolidated Financial Statements.

Recent Accounting Pronouncements

See Note B of our Consolidated Financial Statements for a description of recent accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Market Risks

Market risk represents the risk of loss that may impact our financial statements through adverse changes in financial market prices and rates and inflation. Our market risk exposure results primarily from fluctuations in foreign exchange and interest rates. We manage our exposure to these market risks through our regular operating and financing activities. We have not historically attempted to reduce our market risks through hedging instruments; we may, however, do so in the future.

Interest Rate Fluctuation Risk

Our cash equivalents consisted primarily of money market funds, and interest and non-interest bearing bank deposits. Our primary objective is to maintain the security of our principal balances and ensure liquidity. We attempt to maximize the return on these balances without significantly increasing risk, but have little opportunity to do so given the short-term nature of our investments and current interest rate environments. We do not anticipate any material effect on our cash balances or investment portfolio due to fluctuations in interest rates.

We ~~are~~ could be exposed to ~~market~~ interest rate risk, due to the possibility of changing ~~should we incur debt that had a floating interest rates associated with certain debt instruments.~~ rate. As of December 31, ~~2022~~ 2023, our debt bears ~~all debts bore a variable fixed interest rate of and therefore did not generate interest that is based on SOFR or other interbank offered rates. The debt subject to variable rates is subject to fluctuation in the SOFR or other interbank offered rates.~~ rate risk. As of December 31, ~~2022~~ 2023, we had not hedged our interest rate risk.

During a portion of the year ending ending December 31, 2023, we did have certain loans that bore floating interest rates. With respect to our interest expense for the year ended December 31, ~~2022~~ 2023, an increase of 1.0% in each of our interest rates would have resulted in an increase of ~~\$0.6 million~~ \$0.2 million in our interest expense for such period.

Foreign Exchange Rates

We operate on an international basis with a large portion of our business conducted in our Taiwan branch and China subsidiary. We use the U.S. dollar as our reporting currency for our consolidated financial statements. The financial records of our China subsidiary and our Taiwan branch are maintained in their respective local currencies, the RMB and the NT dollar, which are the functional currencies for our China subsidiary and our Taiwan branch, respectively. Assets and liabilities are translated at prevailing exchange rates at the balance sheet date, equity accounts are translated at historical exchange rates and revenues, expenses, gains and losses are translated using the average rate for the then current period using a monthly average. Translation adjustments are reported as cumulative translation adjustments and are shown as a separate component of accumulated other comprehensive income in our statement of stockholders' equity and comprehensive income.

All transactions in currencies other than their functional currencies during the year are subject to foreign exchange risk when the exchange rate fluctuates on the respective relevant dates of such transactions. Transaction gains and losses are recognized in our statements of operations in other income (expense). Monetary assets and liabilities existing at the balance sheet date denominated in currencies other than the functional currencies are re-measured at the exchange rates prevailing on the balance sheet date and unrealized exchange differences are recorded in our consolidated income statement. In October 2015, we determined that certain intercompany loans are long-term investments. Therefore, exchange gain (loss) arising from re-measurement of intercompany loans were recorded in the Cumulative Translation Adjustment accounts.

During the year ended December 31, ~~2022~~ 2023, we recognized approximately ~~\$1.5 million~~ \$0.7 million of exchange ~~loss~~ gain arising from foreign currency transactions and re-measurement of monetary assets and liabilities dominated in non-functional currency on the balance sheet date.

During the year ended December 31, ~~2022~~ 2023, ~~4.7%~~ 1.8% of our revenue was denominated in RMB and none of our revenue was denominated in NT dollars. In the year ended December 31, ~~2022~~ 2023, ~~25.8%~~ 22% of our operating expenses were denominated in RMB and ~~18.9%~~ 16.7% of our operating expenses were denominated in NT dollars. Accordingly, fluctuations in exchange rates directly affect our cost of goods sold and net income (loss), and have a significant impact on our operating margins. If exchange rates of RMB and NT dollars for U.S. dollars were 1% higher during the year ended December 31, ~~2022~~ 2023, our operating expenses would have had been higher by \$0.4 million.

As of December 31, 2022 2023, we held the U.S. dollar denominated liabilities net of assets of approximately \$24.6 \$11.4million in our China subsidiary and \$26.7 \$16.2 million in our Taiwan branch. With respect to these U.S. dollar denominated net assets as of December 31, 2022 2023, if exchange rates of RMB and NT dollars for U.S. dollars were 1% higher during the year ended December 31, 2022 2023, our other operating expenses would have been reduced by \$0.4 million. \$48K. Any significant revaluation of the RMB and NT dollars may materially and adversely affect the cash flows, revenues, and net income (loss) as reported in U.S. dollars.

We currently do not use derivative financial instruments to mitigate this exposure. We continue to review this issue and may consider hedging certain foreign exchange risks through the use of currency forwards or options in future years.

Item 8. Financial Statements and Supplementary Data

The information required by this item is incorporated by reference to the consolidated financial statements and accompanying notes beginning on page F-1 of this Form 10-K.

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

None.

Item 9A. Controls and Procedures

a. Evaluation of Disclosure Controls and Procedures.

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2022 2023. Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of the end of the period covered in this Form 10-K, our disclosure controls and procedures were effective.

b. Management's Annual Report on Internal Control over Financial Reporting.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act). Internal control over financial reporting is a process designed by, or under the supervision of, the issuer's principal executive and principal financial officers, or persons performing similar functions, and effected by our board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that our degree of compliance with the policies or procedures may deteriorate.

Our management conducted an evaluation of the effectiveness of our internal control over financial reporting as of the end of the period covered by this Form 10-K based on the framework in Internal Control—Integrated Framework (2013) issued by the Committee of Sponsoring Organization of the Treadway Commission. Based on this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2022 2023.

Grant Thornton LLP, the independent registered public accounting firm that audited the consolidated financial statements included in this Form 10-K, has issued a report, included below, on the effectiveness of our internal control over financial reporting as of December 31, 2023.

c. Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) identified in connection with management's evaluation required by the Rules 13a-15(d) and 15d-15(d) under the Exchange Act that occurred during our last fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders

Applied Optoelectronics, Inc.

Opinion on internal control over financial reporting

We have audited the internal control over financial reporting of Applied Optoelectronics, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2023, based on criteria established in the 2013 *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in the 2013 *Internal Control—Integrated Framework* issued by COSO.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated financial statements of the Company as of and for the year ended December 31, 2023, and our report dated February 23, 2024 expressed an unqualified opinion on those financial statements.

Basis for opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and limitations of internal control over financial reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ GRANT THORNTON LLP

Houston, Texas

February 23, 2024

Item 9B. Other Information

Rule 10b5-None.1 Trading Plans

The adoption or termination of contracts, instructions or written plans for the purchase or sale of our securities by our Section 16 officers and directors for the three months ended December 31, 2023, each of which is intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act ("Rule 10b5-1 Plan"), were as follows:

Name	Title	Action	Date Adopted	Expiration Date	Aggregate # of Securities to be Purchased/Sold
Chih-Hsiang (Thompson) Lin (1)	CEO	Adoption	12/14/2023	3/15/2025	60,000
Stefan Murry (2)	CFO	Adoption	12/14/2023	10/31/2024	12,000
Hung-Lun (Fred) Chang (3)	SVP/North America General Manager	Adoption	12/14/2023	1/31/2025	18,195
David Kuo (4)	SVP/CLO	Adoption	12/14/2023	2/28/2025	40,000

- (1) Chih-Hsiang (Thompson) Lin, our CEO, entered into a Rule 10b5-1 Plan on December 14, 2023. Mr. Lin's plan provides for the potential sale of 60,000 shares of the Company's common stock. The Plan expires on March 15, 2025, or upon the earlier of completion of all authorized transactions under the plan.
- (2) Stefan Murry, our CFO, entered into a Rule 10b5-1 Plan on December 14, 2023. Mr. Murry's plan provides for the potential sale of 12,000 shares of the Company's common stock. The Plan expires on October 31, 2024, or upon the earlier of completion of all authorized transactions under the plan.
- (3) Hung-Lun (Fred) Chang, our Senior Vice President and North America General Manager, entered into a Rule 10b5-1 Plan on December 14, 2023. Mr. Chang's plan provides for the potential sale of up to 18,195 shares of the Company's common stock. The plan expires January 31, 2025, or upon the earlier of the completion of all authorized transactions under the plan.
- (4) David Kuo, our Senior Vice President and Chief Legal Officer, entered into a Rule 10b5-1 Plan on December 14, 2023. Mr. Kuo's plan provides for the potential sale of up to 40,000 shares of the Company's common stock. The plan expires February 28, 2025, or upon the earlier completion of all authorized transactions under the plan.

Item 9C. Disclosure Regarding Foreign Jurisdiction that Prevent Inspections

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item (other than the information set forth in the next paragraph in this Item 10) will be included in our definitive proxy statement with respect to our 2023 2024 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission and is incorporated herein by reference.

Adoption of Code of Ethics

The Company has adopted a Code of Business Conduct and Ethics (the "Code") applicable to all of our board of director members, employees and executive officers, including our Chief Executive Officer (Principal Executive Officer), and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer). The Company has made the Code available on our website at <http://www.ao-inc.com>.

The Company intends to satisfy the public disclosure requirements regarding (1) any amendments to the Code, or (2) any waivers under the Code given to our Principal Executive Officer, Principal Financial Officer and Principal Accounting Officer by posting such information on our website at www.ao-inc.com. There were no amendments to the Code or waivers granted thereunder relating to the Principal Executive Officer, Principal Financial Officer or Principal Accounting Officer during 2022 2023.

Item 11. Executive Compensation

The information required by this item will be included in our definitive proxy statement with respect to our 2023 2024 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission and is incorporated herein by reference.

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

The information required by this item will be included in our definitive proxy statement with respect to our 2023 2024 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission and is incorporated herein by reference.

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

The information required by this item will be included in our definitive proxy statement with respect to our 2023 2024 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by this item will be included in our definitive proxy statement with respect to our 2023 2024 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statements Schedules

(a)(1) The consolidated financial statements are listed on the Index to Consolidated Financial Statements to this Form 10-K beginning on page F-1.

(a)(2) Financial Statement Schedules. Financial statement schedules have been omitted, as the information required to be set forth therein is included in the Consolidated Financial Statements or Notes thereto appearing in this Form 10-K.

(a)(3) Exhibits. See the Exhibit immediately following Item 16. Form 10-K Summary of this Form 10-K.

Item 16. Form 10-K Summary

None.

EXHIBIT INDEX

Number		Exhibit Description	Form	Incorporated By Reference		Filing Date
				File No.	Exhibit	
2.1	**	Agreement for the Sale and Purchase of a New Company to Be Established in Hong Kong Special Administrative Region of The People's Republic of China, dated as of September 15, 2022, by and between Prime World International Holdings Ltd., Applied Optoelectronics, Inc. and Yuhan Optoelectronics Technology (Shanghai) Co., Ltd.	8-K	001-36083	2.1	September 15, 2022
3.1		Amended and Restated Certificate of Incorporation of the registrant, as currently in effect	10-Q	001-36083	3.1	November 14, 2013
3.2		Amended and Restated Bylaws of the registrant, as currently in effect	10-Q	001-36083	3.2	November 14, 2013
4.1		Common Stock Specimen	8-K	001-36083	4.1	November 14, 2016
4.2		Indenture, dated as of March 5, 2019 between Applied Optoelectronics, Inc. and Wells Fargo Bank, National Association, as trustee, paying agent, and conversion agent	8-K	001-36083	4.1	March 5, 2019
4.3		Form of Note representing the Company's 5.00% Convertible Senior Notes due 2024 (included as Exhibit A to the Indenture)	8-K	001-36083	4.1	March 5, 2019
4.4		Description of Company's Common Stock	10-K	001-36083	4.4	February 28, 2020
10.1		Form of Indemnification Agreement between the registrant each of its Directors and certain of its Executive Officers	S-1	333-190591	10.1	August 13, 2013
10.2	†	2006 Incentive Share Plan	S-1	333-190591	10.5	August 13, 2013
10.2.1	†	First Amendment to 2006 Incentive Share Plan	S-1/A	333-190591	10.5.1	August 27, 2013
10.2.2	†	Form of Stock Option Agreement under 2006 Incentive Share Plan	S-1	333-190591	10.5.2	August 13, 2013

10.3 †	Amended and Restated 2013 Equity Incentive Plan	10-K	001-36083	10.6	March 9, 2017
10.3.1 †	Form of Restricted Stock Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.1	August 13, 2013
10.3.2 †	Form of Restricted Stock Unit Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.2	August 13, 2013
10.3.3 †	Form of Stock Appreciation Right Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.3	August 13, 2013
10.3.4 †	Form of Notice of Stock Option Award and Stock Option Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.4	August 13, 2013
10.4 †	Amended and Restated Employment Agreement regarding Change of Control or Separation of Service between the registrant and Chih-Hsiang (Thompson) Lin, dated April 16, 2013	S-1	333-190591	10.12.1	August 13, 2013
10.5 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Stefan J. Murry	10-Q/A	001-36083	10.20	August 9, 2016
10.6 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Mr. Joshua Yeh	10-Q/A	001-36083	10.21	August 9, 2016
10.7 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Dr. Fred Chang	10-Q/A	001-36083	10.22	August 9, 2016
10.8 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and David C. Kuo	10-K	001-36083	10.9	February 28, 2018

Number	Exhibit Description	Form	Incorporated By Reference		
			File No.	Exhibit	Filing Date
2.1 **	Agreement for the Sale and Purchase of a New Company to Be Established in Hong Kong Special Administrative Region of The People's Republic of China, dated as of September 15, 2022, by and between Prime World International Holdings Ltd., Applied Optoelectronics, Inc. and Yuhon Optoelectronics Technology (Shanghai) Co., Ltd.	8-K	001-36083	2.1	September 15, 2022
3.1	Amended and Restated Certificate of Incorporation of the registrant, as currently in effect	10-Q	001-36083	3.1	November 14, 2013
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Applied Optoelectronics, Inc.	8-K	001-36083	3.1	September 7, 2023
3.3	Amended and Restated Bylaws of the registrant, as currently in effect	10-Q	001-36083	3.2	November 14, 2013
4.1	Common Stock Specimen	8-K	001-36083	4.1	November 14, 2016

4.2	Indenture, dated as of March 5, 2019 between Applied Optoelectronics, Inc. and Wells Fargo Bank, National Association, as trustee, paying agent, and conversion agent	8-K	001-36083	4.1	March 5, 2019
4.3	Form of Note representing the Company's 5.00% Convertible Senior Notes due 2024 (included as Exhibit A to the Indenture)	8-K	001-36083	4.1	March 5, 2019
4.4	Indenture, dated as of December 5, 2023, between Applied Optoelectronics, Inc. and Computershare Trust Company, N.A., as Trustee	8-K	001-36083	4.1	December 5, 2023
4.5	Form of 5.250% Convertible Senior Note due 2026 (included as an exhibit to Exhibit 4.1)	8-K	001-36083	4.2	December 5, 2023
4.6	First Supplemental Indenture, dated as of December 5, 2023, between Applied Optoelectronics, Inc. and Computershare Trust Company, N.A., as Trustee	8-K	001-36083	4.3	December 5, 2023
4.7 *	Description of Company's Common Stock				
10.1	Form of Indemnification Agreement between the registrant each of its Directors and certain of its Executive Officers	S-1	333-190591	10.1	August 13, 2013
10.2 †	Amended and Restated 2013 Equity Incentive Plan	10-K	001-36083	10.6	March 9, 2017
10.2.1 †	Form of Restricted Stock Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.1	August 13, 2013
10.2.2 †	Form of Restricted Stock Unit Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.2	August 13, 2013
10.2.3 †	Form of Stock Appreciation Right Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.3	August 13, 2013
10.2.4 †	Form of Notice of Stock Option Award and Stock Option Award Agreement under 2013 Equity Incentive Plan	S-1	333-190591	10.6.4	August 13, 2013
10.4 †	2021 Stock Incentive Plan	10-Q	001-36083	10.1	August 5, 2021
10.4.1 †	Form of Restricted Stock Unit Award Agreement under 2021 Equity Incentive Plan	10-Q	001-36083	10.4.1	August 5, 2021
10.4.2 †	Form of Performance Restricted Stock Unit Award Agreement under 2021 Equity Incentive Plan	10-Q	001-36083	10.4.2	August 5, 2021

						Incorporated By Reference	
Number	Exhibit Description	Form	File No.	Exhibit	Filing Date		
10.9	Loan Agreement, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.1	October 4, 2017		

10.9.1	Promissory Note, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36-83	10.2	October 4, 2017
10.9.2	Addendum to the Promissory Note, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36-83	10.3	October 4, 2017
10.9.3	BB&T Security Agreement, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.4	October 4, 2017
10.9.4	Trademark Security Agreement, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.5	October 4, 2017
10.9.5	Patent Security Agreement, dated September 28, 2017, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.6	October 4, 2017
10.10	Supply Agreement, effective November 8, 2017, between Applied Optoelectronics, Inc. and Facebook, Inc.	8-K	001-36083	10.1	February 24, 2018
10.11	Master Purchase Agreement, effective January 2, 2018, between Applied Optoelectronics, Inc. and Facebook, Inc.	8-K	001-36083	10.2	February 21, 2018
10.12	Translation of Lease Agreement between Global Technology, Inc. and the People's Republic of China in Zhejiang Province, Ningbo City, Land Resources Bureau	10-K	001-36083	10.30	February 28, 2018
10.12.1	Translation of Investment and Construction Agreement between Global Technology, Inc. and the People's Republic of China in Zhejiang Province, Ningbo City, Land Resources Bureau	10-K	001-36083	10.30.1	February 28, 2018
10.13	Translation of Construction Agreement between Global Technology, Inc. and Zhejiang Xinyu Construction Group Co., Ltd. dated February 8, 2018	10-Q	001-36083	10.5	May 8, 2018
10.14	First Amendment to Loan Agreement, dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.1	April 5, 2018
10.14.1	Addendum to the Promissory Note (\$60 million), dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.2	April 5, 2018
10.14.2	Promissory Note (\$26 million), dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.3	April 5, 2018

10.14.3	Addendum to the Promissory Note (\$26 million), dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.4	April 5, 2018
10.14.4	Promissory Note (\$21.5 million), dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.5	April 5, 2018

Incorporated By Reference					
Number	Exhibit Description	Form	File No.	Exhibit	Filing Date
10.5 †	Applied Optoelectronic, Inc. 2023 Equity Incentive Plan	10-Q	001-36083	10.1	November 9, 2023
10.6 †	Amended and Restated Employment Agreement regarding Change of Control or Separation of Service between the registrant and Chih-Hsiang (Thompson) Lin, dated April 16, 2013	S-1	333-190591	10.12.1	August 13, 2013
10.7 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Stefan J. Murry	10-Q/A	001-36083	10.20	August 9, 2016
10.8 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Mr. Joshua Yeh	10-Q/A	001-36083	10.21	August 9, 2016
10.9 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and Dr. Fred Chang	10-Q/A	001-36083	10.22	August 9, 2016
10.10 †	Employment Agreement, dated August 5, 2016, between Applied Optoelectronics, Inc. and David C. Kuo	10-K	001-36083	10.9	February 28, 2018
10.11	Supply Agreement, effective November 8, 2017, between Applied Optoelectronics, Inc. and Facebook, Inc.	8-K	001-36083	10.1	February 24, 2018
10.12	Master Purchase Agreement, effective January 2, 2018, between Applied Optoelectronics, Inc. and Facebook, Inc.	8-K	001-36083	10.2	February 21, 2018
10.13	Translation of Lease Agreement between Global Technology, Inc. and the People's Republic of China in Zhejiang Province, Ningbo City, Land Resources Bureau	10-K	001-36083	10.30	February 28, 2018
10.13.1	Translation of Investment and Construction Agreement between Global Technology, Inc. and the People's Republic of China in Zhejiang Province, Ningbo City, Land Resources Bureau	10-K	001-36083	10.30.1	February 28, 2018
10.14	Translation of Construction Agreement between Global Technology, Inc. and Zhejiang Xinyu Construction Group Co., Ltd. dated February 8, 2018	10-Q	001-36083	10.5	May 8, 2018
10.15	First Amendment to Lease, dated October 8, 2018, between Applied Optoelectronics, Inc. and GIG VAOI Breckinridge, LLC	8-K	001-36083	10.1	October 12, 2018
10.16	Purchase Agreement, dated as of February 28, 2019 by and among Applied Optoelectronics, Inc., Raymond James & Associates, Inc. and Cowen and Company, LLC	8-K	001-36083	10.1	March 5, 2019
10.17	Translation of the Working Capital Loan Contract, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated April 30, 2019	8-K	001-36083	10.1	May 6, 2019

10.18	Translation of the Working Capital Loan Contract (RMB 30,000,000), between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated May 7, 2019	8-K	001-36083	10.1	May 13, 2019
10.18.1	Translation of the Working Capital Loan Contract (USD 2,000,000), between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated May 8, 2019	8-K	001-36083	10.2	May 13, 2019
10.19	Translation of the Financing Credit Line Agreement, dated May 24, 2019, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd.	8-K	001-36083	10.1	May 31, 2019
10.19.1	Translation of the Maximum Mortgage Contract (Security Agreement), dated May 24, 2019, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd.	8-K	001-36083	10.2	May 31, 2019
10.20	Second Amendment to Lease, dated November 11, 2019, between Applied Optoelectronics, Inc. and ROIB2 Breckinridge, LLC.	8-K	001-36083	10.1	November 18, 2019
10.21	Paycheck Protection Program Loan Promissory Note, dated April 17, 2020, executed by Applied Optoelectronics, Inc.	8-K	001-36083	10.1	April 22, 2020

Incorporated By Reference					
Number	Exhibit Description	Form	File No.	Exhibit	Filing Date
10.14.5	Addendum to the Promissory Note (\$21.5 million), dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.6	April 5, 2018
10.14.6	Note Modification Agreement, dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.7	April 5, 2018
10.14.7	Assignment of Lease and Rent, dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.8	April 5, 2018
10.14.8	Texas Deed of Trust and Security Agreement, dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.9	April 5, 2018
10.14.9	Environmental Certification and Indemnity Agreement, dated March 30, 2018, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.10	April 5, 2018
10.15	First Amendment to Lease, dated October 8, 2018, between Applied Optoelectronics, Inc. and GIG VAOI Breckinridge, LLC.	8-K	001-36083	10.1	October 12, 2018
10.16	Translation of Purchase and Sale Contract, Finance Lease Agreement and Promissory Note, dated November 29, 2018, between Prime World International Holdings, Ltd., and Chailease Finance Co., Ltd.	8-K	001-36083	10.1	December 6, 2018

10.17	Translation of Purchase and Sale Contract, Finance Lease Agreement and Promissory Note, dated January 21, 2019, between Prime World International Holdings, Ltd. and Chailease Finance Co., Ltd.	8-K	001-36083	10.1	January 25, 2019
10.18	Second Amendment to Loan Agreement, dated February 1, 2019, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company.	8-K	001-36083	10.1	February 7, 2019
10.19	Purchase Agreement, dated as of February 28, 2019 by and among Applied Optoelectronics, Inc., Raymond James & Associates, Inc. and Cowen and Company, LLC	8-K	001-36083	10.1	March 5, 2019
10.19.1	Third Amendment to Loan Agreement, dated March 5, 2019, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company.	8-K	001-36083	10.2	March 5, 2019
10.20	Translation of Approval Notice between, Prime World International Holdings, Ltd., and Far Eastern International Bank Co., Ltd., dated April 11, 2019	8-K	001-36083	10.1	April 17, 2019
10.20.1	Translation of Comprehensive Credit Facilities Master Agreement between, Prime World International Holdings, Ltd., and Far Eastern International Bank Co., Ltd., dated April 11, 2019	8-K	001-36083	10.2	April 17, 2019
10.20.2	Translation of Credit Terms / Financial Transaction Terms Agreement between, Prime World International Holdings, Ltd., and Far Eastern International Bank Co., Ltd., dated April 11, 2019	8-K	001-36083	10.3	April 17, 2019
10.20.3	Translation of Promissory Note between, Prime World International Holdings, Ltd., and Far Eastern International Bank Co., Ltd., dated April 11, 2019	8-K	001-36083	10.4	April 17, 2019
10.21	Translation of the Credit Granting Agreement, between Global Technology, Inc. and China Merchants Bank Co., Ltd., dated April 19, 2019	8-K	001-36083	10.1	April 25, 2019
10.22	Translation of the Working Capital Loan Contract, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated April 30, 2019	8-K	001-36083	10.1	May 6, 2019

Incorporated By Reference

Number	Exhibit Description	Form	File No.	Exhibit	Filing Date
10.22	Translation of the Maximum Loan Contract between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated June 7, 2022.	8-K	001-36083	10.1	June 10, 2022
10.22.1	Translation of the Maximum Mortgage Contract, between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated June 7, 2022.	8-K	001-36083	10.2	June 10, 2022
10.23	Form of Trademark License Agreement, by and among Applied Optoelectronics, Inc., and Global Technology Co., Ltd., and Yuhan Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.1	September 15, 2022
10.23.1	Form of Technology Cross-License Agreement, by and among Applied Optoelectronics, Inc., Global Technology Co., Ltd., and Yuhan Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.2	September 15, 2022

10.23.2 **	Form of Product Supply Agreement, by and between Applied Optoelectronics, Inc. and Yuhan Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.3	September 15, 2022
10.23.3 **	Form of Contract Manufacturing Agreement, by and among Applied Optoelectronics, Inc., Global Technology Co., Ltd., and Yuhan Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.4	September 15, 2022
10.24	Loan Security and Guarantee Agreement, dated November 16, 2022, between Applied Optoelectronics, Inc. and CIT Northbridge Credit, LLC.	8-K	001-36083	10.1	November 21, 2022
10.25	Statement of Work No. 1 – Foundry between Applied Optoelectronics, Inc. and Microsoft Corporation, effective December 16, 2022	8-K	001-36083	10.1	May 3, 2023
10.25.1	Microsoft Corporation Purchase Order Terms & Conditions (included as Appendix C to Exhibit 10.1)	8-K	001-36083	10.2	May 3, 2023

Number	Exhibit Description	Form	Incorporated By Reference		
			File No.	Exhibit	Filing Date
10.23	Translation of the Working Capital Loan Contract (RMB 30,000,000), between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated May 7, 2019	8-K	001-36083	10.1	May 13, 2019
10.23.1	Translation of the Working Capital Loan Contract (USD 2,000,000) between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd., dated May 8, 2019	8-K	001-36083	10.2	May 13, 2019
10.24	Translation of the Financing Credit Line Agreement, dated May 24, 2019, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd.	8-K	001-36083	10.1	May 31, 2019
10.24.1	Translation of the Maximum Mortgage Contract (Security Agreement), dated May 24, 2019, between Global Technology, Inc. and Shanghai Pudong Development Bank Co., Ltd.	8-K	001-36083	10.2	May 31, 2019
10.25	Translation of the Maximum Loan Contract (¥100M), dated June 21, 2019, between Global Technology, Inc. and China Zheshang Bank Co., Ltd.	8-K	001-36083	10.1	June 27, 2019
10.25.1	Translation of the Maximum Mortgage Contract (the "Real Estate Security Agreement"), dated June 21, 2019, between Global Technology, Inc. and China Zheshang Bank Co., Ltd.	8-K	001-36083	10.2	June 27, 2019
10.25.2	Translation of the Maximum Loan Contract (¥50M), dated June 21, 2019, between Global Technology, Inc. and China Zheshang Bank Co., Ltd.	8-K	001-36083	10.3	June 27, 2019
10.25.3	Translation of the Maximum Mortgage Contract (the "Machinery and Equipment Security Agreement"), dated June 21, 2019, between Global Technology, Inc. and China Zheshang Bank Co., Ltd.	8-K	001-36083	10.4	June 27, 2019
10.26	Translation of the Approval Notice of Credit Line, dated July 8, 2019, between Prime World International Holdings Ltd. and Taishin International Bank	10-Q	001-36083	10.11	August 8, 2019
10.26.1	Translation of the General Agreement for Financial Transaction, dated July 23, 2019, between Prime World International Holdings Ltd. and Taishin International Bank	10-Q	001-36083	10.12	August 8, 2019

10.26.2	Translation of the Credit Facility Agreement, dated July 23, 2019, between Prime World International Holdings Ltd. and Taishin International Bank	10-Q	001-36083	10.13	August 8, 2019
10.26.3	Translation of the Promissory Note, dated July 23, 2019, between Prime World International Holdings Ltd. and Taishin International Bank	10-Q	001-36083	10.14	August 8, 2019
10.27 **	Fourth Amendment to Loan Agreement, dated September 30, 2019, between Applied Optoelectronics, Inc. and Branch Banking and Trust Company	8-K	001-36083	10.1	October 4, 2019
10.27.1	Note Modification Agreement, dated September 30, 2019, executed by Applied Optoelectronics, Inc.	8-K	001-36083	10.2	October 4, 2019
10.27.2	Addendum To Promissory Note, dated September 30, 2019, executed by Applied Optoelectronics, Inc.	8-K	001-36083	10.3	October 4, 2019
10.28	Second Amendment to Lease, dated November 11, 2019, between Applied Optoelectronics, Inc. and ROIB2 Breckinridge, LLC.	8-K	001-36083	10.1	November 18, 2019
10.29	Paycheck Protection Program Loan Promissory Note, dated April 17, 2020, executed by Applied Optoelectronics, Inc.	8-K	001-36083	10.1	April 22, 2020
10.30	Translation of Amendment to the Finance Lease Agreements, dated September 15, 2020, between Prime World International Holdings Ltd., and Chailease Finance Co., Ltd.	8-K	001-36083	10.1	September 18, 2020

Number	Exhibit Description	Form	Incorporated By Reference		
			File No.	Exhibit	Filing Date
10.31	Translation of the Credit Facility Agreement, dated October 7, 2020, between Prime World International Holdings Ltd. and Taishin International Bank.	8-K	001-36083	10.1	October 13, 2020
10.31.1	Translation of the Notice of Credit Line Approval, dated August 24, 2020.	8-K	001-36083	10.2	October 13, 2020
10.32	Translation of the Credit Granting Agreement, between Global Technology Inc. and China Merchants Bank Co., Ltd., dated October 19, 2020.	8-K	001-36083	10.2	October 22, 2020
10.33	Translation of the Maximum Loan Contract, between Global Technology, Inc. and China Zheshang Bank Co., Ltd, dated January 6, 2021.	8-K	001-36083	10.1	January 11, 2021
10.33.1	Translation of the Maximum Mortgage Contract, between Global Technology, Inc. and China Zheshang Bank Co., Ltd, dated January 6, 2021.	8-K	001-36083	10.2	January 11, 2021
10.34	Fifth Amendment to Loan Agreement and Fourth Amendment to Security Agreement, dated April 5, 2021, between Applied Optoelectronics, Inc. and Truist Bank	8-K	001-36083	10.1	April 9, 2021
10.34.1	Note Modification Agreement, dated April 5, 2021, between Applied Optoelectronics, Inc. and Truist Bank.	8-K	001-36083	10.2	April 9, 2021
10.34.1	Addendum to Promissory Note, dated April 5, 2021, between Applied Optoelectronics, Inc. and Truist Bank.	8-K	001-36083	10.3	April 9, 2021

10.35	†	2021 Stock Incentive Plan.	10-Q	001-36083	10.4	August 5, 2021
10.35.1	†	Form of Restricted Stock Unit Award Agreement under 2021 Equity Incentive Plan.	10Q	001-36083	10.4.1	August 5, 2021
10.35.2	†	Form of Performance Restricted Stock Unit Award Agreement under 2021 Equity Incentive Plan.	10Q	001-36083	10.4.2	August 5, 2021
10.36		Sixth Amendment to Loan Agreement and Fifth Amendment to Security Agreement, December 29, 2021, between Applied Optoelectronics, Inc. and Truist Bank.	8-K	001-36083	10.1	January 5, 2022
10.36.1		Note Modification Agreement, dated December 29, 2021, between Applied Optoelectronics, Inc. and Truist Bank.	8-K	001-36083	10.2	January 5, 2022
10.36.2		Addendum to Promissory Note, dated December 29, 2021, between Applied Optoelectronics, Inc. and Truist Bank.	8-K	001-36083	10.3	January 5, 2022
10.37		Translation of the Maximum Loan Contract between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated June 7, 2022.	8-K	001-36083	10.1	June 10, 2022
10.37.1		Translation of the Maximum Mortgage Contract, between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated June 7, 2022.	8-K	001-36083	10.2	June 10, 2022
10.38		Form of Trademark License Agreement, by and among Applied Optoelectronics, Inc., and Global Technology Co., Ltd., and Yuhua Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.1	September 15, 2022
10.38.1		Form of Technology Cross-License Agreement, by and among Applied Optoelectronics, Inc., Global Technology Co., Ltd., and Yuhua Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.2	September 15, 2022
10.38.2	**	Form of Product Supply Agreement, by and between Applied Optoelectronics, Inc. and Yuhua Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.3	September 15, 2022

Number		Exhibit Description	Form	Incorporated By Reference		
				File No.	Exhibit	Filing Date
10.38.3	**	Form of Contract Manufacturing Agreement, by and among Applied Optoelectronics, Inc., Global Technology Co., Ltd., and Yuhua Optoelectronic Technology (Shanghai) Co., Ltd.	8-K	001-36083	10.4	September 15, 2022
10.39		Loan Security and Guarantee Agreement, dated November 16, 2022, between Applied Optoelectronics, Inc. and CIT Northbridge Credit, LLC.	8-K	001-36083	10.1	November 21, 2022
21.1		Subsidiaries of the registrant	S-1	333-190591	21.1	August 13, 2013
23.1	*	Consent of Grant Thornton LLP				
24.1		Power of Attorney (see the signature page in this Annual Report on Form 10-K).				
31.1	*	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of The Sarbanes-Oxley Act of 2002.				

31.2 * [Certification of Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of The Sarbanes-Oxley Act of 2002.](#)

32.1 * [Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350 as adopted pursuant to Section 906 of The Sarbanes-Oxley Act of 2002.](#)

101.INS Inline XBRL Instance Document

101.SCH Inline XBRL Taxonomy Extension Schema Document

101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase Document

101.DEF Inline XBRL Taxonomy Extension Definition Linkbase Document

101.LAB Inline XBRL Taxonomy Extension Label Linkbase Document

101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase Document

104 Number	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101) Description	Form	File No.	Exhibit	Filing Date	Incorporated By Reference
10.26	Third Amendment to Lease, dated June 9, 2023, between Applied Optoelectronics, Inc. and Albany Road-Breck Exchange LLC	8-K		001-36083	10.1	June 14, 2023
10.27	Statement of Work No. 2 – Design and Assembly, between Applied Optoelectronics, Inc. and Microsoft Corporation, effective June 21, 2023	8-K		001-36083	10.1	June 21, 2023
10.27.1	Microsoft Corporation Purchase Order Terms & Conditions (included as Appendix J to Exhibit 10.1)	8-K		001-36083	10.2	June 21, 2023
10.28	Form of Exchange Agreement, dated as of November 30, 2023, between Applied Optoelectronics, Inc. and the applicable Noteholders	8-K		001-36083	10.1	December 1, 2023
10.29 **	Purchase Agreement, dated as of November 30, 2023, by and between Applied Optoelectronics, Inc. and Raymond James & Associates, Inc.	8-K		001-36083	10.1	December 5, 2023
10.30	Translation of the Asset Pool Agreement, between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated December 21, 2023	8-K		001-36083	10.1	December 27, 2023
10.30.1	Translation of the Pledge Contract, between Global Technology, Inc. and China Zheshang Bank Co., Ltd., dated December 21, 2023	8-K		001-36083	10.2	December 27, 2023
21.1	Subsidiaries of the registrant	S-1		333-190591	21.1	August 13, 2013
23.1 *	Consent of Grant Thornton LLP					
24.1	Power of Attorney (see the signature page in this Annual Report on Form 10-K)					

31.1 * [Certification of Principal Executive Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of The Sarbanes-Oxley Act of 2002.](#)

31.2 * [Certification of Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of The Sarbanes-Oxley Act of 2002.](#)

32.1 * [Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350 as adopted pursuant to Section 906 of The Sarbanes-Oxley Act of 2002.](#)

97 * [Compensation Recovery Policy](#)

101.INS Inline XBRL Instance Document

101.SCH Inline XBRL Taxonomy Extension Schema Document

101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase Document

101.DEF Inline XBRL Taxonomy Extension Definition Linkbase Document

101.LAB Inline XBRL Taxonomy Extension Label Linkbase Document

101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase Document

104 Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

* Filed herewith.

† Management contract, compensatory plan or arrangement.

** Confidential Treatment has been granted for portions of this document.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) the Securities and Exchange Act of 1934, the registrant has duly caused this Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

APPLIED OPTOELECTRONICS, INC.

By: /s/ CHIH-HSIANG (THOMPSON) LIN
CHIH-HSIANG (THOMPSON) LIN,
President and Chief Executive Officer and
Chairman of the Board of Directors

February 24, 2023, 2024

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Chih-Hsiang (Thompson) Lin and Stefan J. Murry, and each of them, jointly and severally, his attorneys-in-fact, each with the power of substitution, for him in any and all capacities, to sign any and all amendments to this Annual Report

on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities and Exchange Act of 1934, this Form 10-K has been signed by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Date
<hr/> <div>/s/ CHIH-HSIANG (THOMPSON) LIN</div> <div>CHIH-HSIANG (THOMPSON) LIN, <i>President, Chief Executive Officer and Chairman of the Board of Directors (principal executive officer)</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ STEFAN J. MURRY</div> <div>STEFAN J. MURRY, <i>Chief Financial Officer (principal financial officer and principal accounting officer)</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ WILLIAM H. YEH</div> <div>WILLIAM H. YEH, <i>Director</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ RICHARD B. BLACK</div> <div>RICHARD B. BLACK, <i>Director</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ CHE-WEI LIN</div> <div>CHE-WEI LIN, <i>Director</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ CYNTHIA (CINDY) DELANEY</div> <div>CYNTHIA (CINDY) DELANEY, <i>Director</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ ELIZABETH LOBOA</div> <div>ELIZABETH LOBOA, <i>Director</i></div>	February 24, 23, 2023 2024
<hr/> <div>/s/ MIN-CHU (MIKE) CHEN</div> <div>MIN-CHU (MIKE) CHEN, <i>Director</i></div>	February 24, 23, 2023 2024

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders

Applied Optoelectronics, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of Applied Optoelectronics, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of **December 31, 2022** **December 31, 2023** and **2021, 2022**, the related consolidated statements of operations, comprehensive income (loss), changes in shareholders' equity, and cash flows for each of the three years in the period ended **December 31, 2022** **December 31, 2023**, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of **December 31, 2022** **December 31, 2023** and **2021, 2022**, and the results of its operations and its cash flows for each of the three years in the period ended **December 31, 2022** **December 31, 2023**, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in the 2013 *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), and our report dated February 23, 2024 expressed an unqualified opinion.

Basis for opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the **Public Company Accounting Oversight Board (United States) ("PCAOB")** **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 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 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical audit matters

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

Inventory Reserve

As described further in Note B to the financial statements, the Company assesses the valuation of its inventory on a periodic basis and provides an allowance a reserve based on several factors including products' life span historical changes in valuation and write-offs, and management's estimates of future demand. One significant estimate and assumption that impacts the financial statements is inventory reserve. We identified the accounting for the inventory reserve as a critical audit matter.

The principal considerations for our determination that accounting for the inventory reserve is a critical audit matter are the judgments and estimates associated with management's determination of inventory reserve adjustments, due to the nature of the inputs and assumptions used in the process and that the reserve is subject to estimation uncertainty and requires auditor subjectivity in evaluating reasonableness. Management developed certain percentages that determine the extent of inventory reserves based on the age and quantity of the inventory. Such percentages were determined through analysis of the inventory to determine each product's lifespan, a review of historical write-offs or scrapped inventory, and an assessment by product engineers of the possibility of obsolescence for each product.

Our audit procedures related to the accounting for the inventory reserve included the following:

- We assessed the qualifications and competence of management and evaluated the methodologies used to determine the inventory reserve;
- We tested the design and operating effectiveness of key controls related to the accounting for the inventory reserve, including controls relating to management's development of the reserve; and
- We obtained the underlying inventory aging report and agreed the balances to the general ledger to test for completeness and performed the following:
 - recalculated the unit price and agreed such unit price to inventory details;
 - selected inventory items to re-age;
 - tested the underlying source of information and the mathematical accuracy of the calculation used in the inventory reserve; and
 - recalculated tested the inventory reserve sensitivity of the inputs utilized in the reserve calculation.

Impairment of Long-Lived Assets

As described further in Note B to the financial statements, the Company accounts for impairment of long-lived assets in accordance with ASC 360, Property, Plant and Equipment ("ASC 360"). Long-lived assets consist primarily of property, plant and equipment, right-of-use assets and intangible assets. The Company evaluates the carrying value of long-lived assets when it determines a triggering event has occurred, or whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. When indicators exist, recoverability of assets is measured by a comparison of the carrying value of the asset group to the estimated undiscounted future net cash flows expected to be generated by the asset asset group. If assets are determined not to be recoverable, the Company performs an analysis of the fair value of the asset group and will recognize an impairment loss when the fair value is less than the carrying amounts of such assets. The undiscounted future net cash flows, and any subsequent fair value determination, are based on assumptions and projections that require subjective judgments. We identified the long-lived assets impairment assessment and cash flow analysis as a critical audit matter.

The principal consideration for our determination that the long-lived assets impairment assessment and cash flow analysis represents a critical audit matter is the judgments and assumptions associated with management's determination of the recoverability of the long-lived assets including any subsequent fair value assessments. Auditing the undiscounted future net cash flows involved a high degree of subjectivity, auditor judgment and audit effort in evaluating management's significant assumptions primarily due to the complexity of the cash flow models used, as well as the sensitivity of the underlying significant assumptions assumptions used in the cash flow analysis. The Company used an undiscounted cash flow model to assess the recoverability of the long-lived assets, which included assumptions such as revenue growth rates, operating expenses, earnings before interest, taxes, depreciation, and amortization ("EBITDA") margins, capital expenditures, asset grouping, forecast period and future sales values. These significant assumptions are forward looking and could be affected by future economic and market conditions.

Our audit procedures related to the accounting for impairment assessment of long-lived assets asset impairment and cash flow analysis included the following:

- We assessed the qualifications and competence of management and evaluated the methodologies used to determine in the fair value impairment assessment of long-lived assets;
- We tested the design and operating effectiveness of key controls related to the accounting for possible impairment, including controls relating to management's development of forecasts for revenue growth rates, operating expenses, EBITDA margins, capital expenditures, asset grouping, forecast period and future sales values;
- We tested the assumptions, including the testing of underlying source information and the mathematical accuracy of the calculations, used within the undiscounted cash flow models to estimate the recoverability of long-lived assets, which included assumptions such as revenue growth rates, operating expenses, EBITDA margins, capital expenditures, asset grouping, forecast period and future sales values;

- We tested the Company's ability to forecast future cash flows by reviewing actual results compared to amounts previously forecasted; and
- We tested the sensitivity of the undiscounted cash flows utilized in the recoverability test.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2008.

Houston, Texas

February 24, 2023 23, 2024

Applied Optoelectronics, Inc. and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(in thousands except the par value)

	December 31,		December 31,	
	2022	2021	2023	2022
ASSETS				
Current Assets				
Cash and cash equivalents	\$ 24,685	\$ 34,656	\$ 45,366	\$ 24,685
Restricted cash	10,902	6,480	9,731	10,902
Accounts receivable - trade, net of allowance of \$28 and \$30, respectively	61,175	47,944		
Accounts receivable - trade, net of allowance of \$3 and \$28, respectively			48,071	61,175
Notes receivable	339	8,148	219	339
Inventories	79,679	92,516	63,866	79,679
Prepaid income tax	—	1	3	—
Prepaid expenses and other current assets	6,384	4,334	5,349	6,384
Total current assets	183,164	194,079	172,605	183,164
Property, plant and equipment, net	210,184	243,035	200,317	210,184
Land use rights, net	5,238	5,856	5,030	5,238
Operating right of use asset	5,566	7,078	5,026	5,566
Financing right of use asset	26	57	—	26
Intangible assets, net	3,699	3,836	3,628	3,699
Other assets, net	386	518	2,580	386
TOTAL ASSETS	\$ 408,263	\$ 454,459	\$ 389,186	\$ 408,263
LIABILITIES AND STOCKHOLDERS' EQUITY				
Current liabilities				
Accounts payable	\$ 47,845	\$ 34,402	\$ 32,892	\$ 47,845
Bank acceptance payable	12,337	8,198	15,482	12,337
Accrued liabilities	17,222	15,587	18,549	17,222
Deferred revenue	3,000	—		
Unearned revenue			1,803	3,000
Current lease liability - operating	1,041	1,062	1,149	1,041
Current lease liability - financing	63	19	—	63
Current portion of notes payable and long-term debt	57,074	49,689	23,197	57,074
Current portion of convertible notes			286	—
Total current liabilities	138,582	108,957	93,358	138,582
Convertible senior notes	79,506	78,680	76,233	79,506
Non-current lease liability - operating	5,505	7,189	4,726	5,505
Non-current lease liability - financing	—	63		
Notes payable and long-term debt, less current portion	—	5,000		

TOTAL LIABILITIES	223,593	199,889	174,317	223,593
Stockholders' equity:				
Preferred Stock; 5,000 shares authorized at \$0.001 par value; no shares issued and outstanding at December 31, 2022 and December 31, 2021, respectively	—	—		
Common Stock; 45,000 shares authorized at \$0.001 par value; 28,622 and 27,323 shares issued and outstanding at December 31, 2022 and December 31, 2021, respectively	29	27		
Preferred Stock; 5,000 shares authorized at \$0.001 par value; no shares issued and outstanding at December 31, 2023 and December 31, 2022, respectively			—	—
Common Stock; 80,000 shares authorized at \$0.001 par value; 38,148 and 28,622 shares issued and outstanding at December 31, 2023 and December 31, 2022, respectively			38	29
Additional paid-in capital	391,526	381,143	478,972	391,526
Accumulated other comprehensive income	2,183	16,071	975	2,183
Accumulated deficit	(209,068)	(142,671)	(265,116)	(209,068)
TOTAL STOCKHOLDERS' EQUITY	184,670	254,570	214,869	184,670
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	\$ 408,263	\$ 454,459	\$ 389,186	\$ 408,263

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

Applied Optoelectronics, Inc. and Subsidiaries
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except share and per share data)

	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2023	2022	2021
Revenue, net	\$ 222,818	\$ 211,565	\$ 234,623	\$ 217,646	\$ 222,818	\$ 211,565
Cost of goods sold	189,191	173,850	184,082	158,725	189,191	173,850
Gross profit	33,627	37,715	50,541	58,921	33,627	37,715
Operating expenses						
Research and development	36,244	41,220	43,393	35,975	36,244	41,220
Sales and marketing	9,723	10,899	14,087	11,069	9,723	10,899
General and administrative	46,658	42,362	41,903	53,226	46,658	42,362
Total operating expenses	92,625	94,481	99,383	100,270	92,625	94,481
Loss from operations	(58,998)	(56,766)	(48,842)	(41,349)	(58,998)	(56,766)
Other income (expense)						
Interest income	126	70	255	609	126	70
Interest expense	(6,319)	(5,620)	(5,635)	(9,428)	(6,319)	(5,620)
Other income (expense), net	(1,205)	8,156	2,998	(5,871)	(1,205)	8,156
Total other income (expense), net	(7,398)	2,606	(2,382)	(14,690)	(7,398)	2,606
Loss before income taxes	(66,396)	(54,160)	(51,224)	(56,039)	(66,396)	(54,160)
Income tax expense	(1)	(2)	(7,228)	(9)	(1)	(2)
Net loss	\$ (66,397)	\$ (54,162)	\$ (58,452)	\$ (56,048)	\$ (66,397)	\$ (54,162)
Net loss per share						
Basic	\$ (2.38)	\$ (2.01)	\$ (2.67)	\$ (1.75)	\$ (2.38)	\$ (2.01)
Diluted	\$ (2.38)	\$ (2.01)	\$ (2.67)	\$ (1.75)	\$ (2.38)	\$ (2.01)
Weighted average shares used to compute net loss per share:						
Basic	27,846,387	26,912,141	21,866,630	31,944,259	27,846,387	26,912,141
Diluted	27,846,387	26,912,141	21,866,630	31,944,259	27,846,387	26,912,141

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

Applied Optoelectronics, Inc. and Subsidiaries
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(in thousands)

	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2023	2022	2021
Net loss	\$ (66,397)	\$ (54,162)	\$ (58,452)	\$ (56,048)	\$ (66,397)	\$ (54,162)
Gain/(Loss) on foreign currency translation adjustment	(13,888)	4,381	11,260	(1,208)	(13,888)	4,381
Comprehensive loss	<u>\$ (80,285)</u>	<u>\$ (49,781)</u>	<u>\$ (47,192)</u>	<u>\$ (57,256)</u>	<u>\$ (80,285)</u>	<u>\$ (49,781)</u>

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

Applied Optoelectronics, Inc. and Subsidiaries
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
Years ended **December 2020, 2021** December 2021, 2022 and **2022 2023**
(in thousands)

	Preferred Stock		Common Stock		Additional paid-in capital	Accumulated other comprehensive gain (loss)	Retained earnings/ (Accumulated deficit)	Stockholders' equity	Preferred Stock		Common Stock		Additional paid-in capital
	Number of shares	Amount	Number of shares	Amount					Number of shares	Amount	Number of shares	Amount	
January 1, 2020	—	\$ —	20,140	\$ 20	\$ 303,401	\$ 430	\$ (30,057)	\$ 273,794					
Public offering of common stock, net	—	—	4,470	4	39,306	—	—	39,310					
Stock options exercised, net of shares withheld for employee tax	—	—	3	—	30	—	—	30					
Issuance of restricted stock, net of shares withheld for employee tax	—	—	497	1	(1,098)	—	—	(1,097)					
Share-based compensation	—	—	—	—	13,046	—	—	13,046					
Foreign currency translation adjustment	—	—	—	—	—	11,260	—	11,260					
Net loss	—	—	—	—	—	—	(58,452)	(58,452)					
December 31, 2020	—	\$ —	25,110	\$ 25	\$ 354,685	\$ 11,690	\$ (88,509)	\$ 277,891					

January 1, 2021											—	\$	—	25,110	\$	25	\$	354,6				
Public offering of common stock, net	—	—	1,552	1	15,288	—	—	15,289	—	—	1,552	1	15,2									
Stock options exercised, net of shares withheld for employee tax	—	—	2	—	8	—	—	8	—	—	2	—										
Issuance of restricted stock, net of shares withheld for employee tax	—	—	659	1	(959)	—	—	(958)	—	—	659	1	(9									
Share-based compensation	—	—	—	—	12,121	—	—	12,121	—	—	—	—	12,1									
Foreign currency translation adjustment	—	—	—	—	—	4,381	—	4,381	—	—	—	—										
Net loss	—	—					(54,162)	(54,162)	—	—	—	—										
December 31, 2021	—	\$	—	27,323	\$	27	\$	381,143	\$	16,071	\$	(142,671)	\$	254,570	—	\$	—	27,323	\$	27	\$	381,1
Public offering of common stock, net	—	—	437	1	1,237	—	—	1,238	—	—	437	1	1,2									
Stock options exercised, net of shares withheld for employee tax	—	—	—	—	—	—	—	—	—	—	—	—										
Issuance of restricted stock, net of shares withheld for employee tax	—	—	862	1	(454)	—	—	(453)	—	—	862	1	(4									
Share-based compensation	—	—	—	—	9,600	—	—	9,600	—	—	—	—	9,6									
Foreign currency translation adjustment	—	—	—	—	—	(13,888)	—	(13,888)	—	—	—	—										
Net loss	—	—	—	—	—	—	(66,397)	(66,397)	—	—	—	—										
December 31, 2022	—	\$	—	28,622	\$	29	\$	391,526	\$	2,183	\$	(209,068)	\$	184,670	—	\$	—	28,622	\$	29	\$	391,5
Public offering of common stock, net											8,275	8	76,4									

Stock options exercised, net of shares withheld for employee tax	—	—	48	—	
Issuance of restricted stock, net of shares withheld for employee tax	—	—	1,203	1	(9)
Share-based compensation	—	—	—	—	11,8
Foreign currency translation adjustment	—	—	—	—	
Net loss	—	—	—	—	
December 31, 2023	—	\$ —	38,148	\$ 38	\$ 478,9

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

Applied Optoelectronics, Inc. and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2023	2022	2021
Operating activities:						
Net loss	\$ (66,397)	\$ (54,162)	\$ (58,452)	\$ (56,048)	\$ (66,397)	\$ (54,162)
Adjustments to reconcile net loss to net cash used in operating activities:						
Allowance of bad debt	(3)	(32)	32	(24)	(3)	(32)
Inventory reserve adjustment	4,900	3,889	3,930			
Lower of cost or net realizable value reserve adjustment to inventory				8,728	4,900	3,889
Depreciation and amortization	23,202	25,371	24,733	20,427	23,202	25,371
Amortization of debt issuance costs	902	865	900	2,308	902	865
Deferred income taxes, net	—	—	7,348			
Loss (gain) on disposal of assets	(47)	1	15	51	(47)	1
Share-based compensation	9,600	12,121	13,046	11,884	9,600	12,121
Interest for extinguishment of debt	—	(70)	—	—	—	(70)
Extinguishment of debt	—	(6,229)	—	—	—	(6,229)
Unrealized foreign exchange (gain) loss	1,916	645	(1,152)	(1,313)	1,916	645
Changes in operating assets and liabilities:						
Accounts receivable, trade	(12,749)	(7,020)	(8,421)	13,128	(12,749)	(7,020)
Notes receivable	7,764	(7,585)	(389)	83	7,764	(7,585)
Prepaid income tax	1	1	188	(3)	1	1
Inventories	1,150	15,786	(23,674)	6,790	1,150	15,786
Other current assets	(2,406)	867	1,220	1,008	(2,406)	867
Operating right of use asset	888	848	407	530	888	848

Accounts payable	12,966	7,069	(3,347)	(14,953)	12,966	7,069
Accrued income taxes	—	1	1	(1)	—	1
Accrued liabilities	5,260	(3,092)	44	1,333	5,260	(3,092)
Unearned Revenue				(1,197)	—	—
Lease liability	(969)	(918)	(438)	(660)	(969)	(918)
Net cash used in operating activities	(14,022)	(11,644)	(44,009)	(7,929)	(14,022)	(11,644)
Investing activities:						
Purchase of property, plant and equipment	(3,210)	(7,981)	(15,795)	(9,079)	(3,210)	(7,981)
Proceeds from disposal of equipment	403	114	216	135	403	114
Deposits and prepaid for equipment	(529)	(2,222)	(3,279)	(5,229)	(529)	(2,222)
Purchase of intangible assets	(498)	(457)	(489)	(588)	(498)	(457)
Net cash used in investing activities	(3,834)	(10,546)	(19,347)	(14,761)	(3,834)	(10,546)
Financing activities:						
Proceeds from issuance of notes payable and long-term debt, net of debt issuance costs	—	—	6,229			
Principal payments of long-term debt and notes payable	(7,336)	(4,144)	(5,233)	(80,214)	(7,336)	(4,144)
Proceeds from line of credit borrowings, net of debt issuance costs	143,261	122,935	95,730	57,626	143,261	122,935
Repayments of line of credit borrowings, net of debt issuance costs	(131,030)	(111,287)	(96,006)	(91,791)	(131,030)	(111,287)
Proceeds from bank acceptance payable	45,666	24,622	39,958	57,057	45,666	24,622
Repayments of bank acceptance payable	(40,573)	(32,465)	(31,338)	(53,748)	(40,573)	(32,465)
Proceeds from issuance of convertible senior notes, net of debt issuance costs	—	—	(18)	83,661	—	—
Principal payments of financing lease	(19)	(18)	(17)	(63)	(19)	(18)
Exercise of stock options	—	8	13	22	—	8
Payments of tax withholding on behalf of employees related to share-based compensation	(453)	(961)	(1,080)	(956)	(454)	(961)
Proceeds from common stock offering, net	1,238	15,397	39,203	68,984	1,238	15,397
Net cash provided by financing activities	10,753	14,087	47,441	40,578	10,753	14,087
Effect of exchange rate changes on cash	1,553	(876)	(999)	1,622	1,553	(876)
Net decrease in cash, cash equivalents and restricted cash	(5,550)	(8,979)	(16,914)	19,510	(5,550)	(8,979)
Cash, cash equivalents and restricted cash at beginning of period	41,136	50,115	67,029	35,587	41,136	50,115
Cash, cash equivalents and restricted cash at end of period	\$ 35,587	\$ 41,136	\$ 50,115	\$ 55,097	\$ 35,587	\$ 41,136
Supplemental disclosure of cash flow information:						
Cash paid (received) for:						
Interest	\$ 5,142	\$ 4,899	\$ 4,971	\$ 8,098	\$ 5,142	\$ 4,899
Income taxes	—	1	(364)	9	—	1
Non-cash investing and financing activities:						
Net change in accounts payable related to property and equipment additions	\$ (164)	\$ (4,027)	\$ (2,326)	\$ 1,053	\$ (164)	\$ (4,027)
Net change in deposits and prepaid for equipment related to property and equipment additions	67	84	(64)	(1,297)	67	84

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

Applied Optoelectronics, Inc. and Subsidiaries
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE A—ORGANIZATION AND OPERATIONS

Applied Optoelectronics, Inc. ("AOI" or the "Company") was incorporated in the State of Texas on February 28, 1997. In March 2013, the Company converted into a Delaware corporation. The Company is a leading, vertically integrated provider of fiber-optic networking products, primarily for four networking end-markets: internet data center, CATV, telecom and FTTH. The Company designs and manufactures a wide range of optical communications products at varying levels of integration, from components, subassemblies and modules to complete turn-key equipment.

The Company has manufacturing and research and development facilities located in the U.S., Taiwan and China. At its corporate headquarters and manufacturing facilities in Sugar Land, Texas, the Company primarily manufactures lasers and laser components and performs research and development activities for laser component and optical module products. The Company operates in Taipei, Taiwan and Ningbo, China through its wholly-owned subsidiary Prime World International Holdings, Ltd. ("Prime World", incorporated in the British Virgin Islands). Prime World is the parent of Global Technology, Inc. ("Global", incorporated in the People's Republic of China). Through Global, the Company primarily manufactures certain of its data center transceiver products, including subassemblies and transceivers, as well as Cable TV Broadband ("CATV") systems and equipment, and performs research and development activities for the CATV products. Prime World also operates a branch in Taiwan, which primarily manufactures transceivers. The Company also has a research and development center in Duluth, Georgia.

On September 15, 2022, we entered into a definitive purchase agreement with Yuhan Optoelectronic Technology (Shanghai) Co., Ltd ("Purchaser"), which is a company incorporated in the People's Republic of China ("PRC"), to divest the Company's manufacturing facilities in the PRC and certain assets related to our transceiver business and multi-channel optical sub-assembly products (collectively, the "Divestiture"). The closing of the transaction is subject to the satisfaction of certain closing conditions, including the approval from the Committee on Foreign Investment in the United States ("CFIUS").

The purchase price will be an amount equal to the \$150 million USD equivalent of Renminbi, less a holdback amount. Prior to the closing of the transaction the Company anticipates investing an amount equal to between 4% and 10% of the estimated proceeds from the transaction in exchange for a 10% equity interest in the Purchaser. The transaction is expected to close in 2023, subject to customary closing conditions and regulatory approval.

Our management has performed an evaluation as required by ASC-360-10-45-9 to determine whether to classify certain of our assets and liabilities as held for sale as of December 31, 2022. ASC 360 requires that a company classifies a business as held for sale in the period in which management commits to a plan to sell the business, the business is available for immediate sale in its present condition, an active program to complete the plan to sell the business is initiated, the sale of the business within one year is probable and the business is being marketed at a reasonable price in relation to its fair value. Although we have announced the execution of a definitive purchase agreement regarding the Divestiture, completion of this transaction is not certain for reasons that include the fact that the proposed sale is subject to regulatory approval in the US and China, the timing and likelihood of which is uncertain and beyond our control, and the fact that we cannot be certain that the buyer will not request modification of terms within the definitive purchase agreement. As a result, we have concluded that at the present time the business is not "available for immediate sale" under the meaning defined in ASC 360 and therefore none of our assets or liabilities should be classified as held for sale.

NOTE B—SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

1. Basis of Presentation

The consolidated financial statements include the accounts of the Company and all of its wholly-owned subsidiaries and are prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). All intercompany balances and transactions have been eliminated in consolidation.

2. Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported. Actual results could differ from those estimates in the consolidated financial statements and accompanying notes. Significant estimates and assumptions that impact these financial statements relate to, among other things, allowance for doubtful accounts, inventory reserve, product warranty costs, share-based compensation expense, estimated useful lives of property and equipment, and taxes.

3. Foreign Currency Translation

The functional currency for the Company's foreign operations is the local currency. The assets and liabilities of these operations are translated at the rate of exchange in effect on the balance sheet date and sales and expenses are translated at monthly average rates. The resulting gains or losses from translation are included in a separate component of other comprehensive income. There is no tax effect on the foreign currency translation because management has concluded that no deferred tax asset (DTA) should be recorded because at it is management's intent to reinvest the present time management cannot conclude that the temporary book-tax basis difference that would create this DTA will reverse in the foreseeable future due to the uncertainties in the timing undistributed earnings of the Divestiture described above in Note A. its foreign subsidiaries indefinitely. Transaction gains and losses resulting from re-measuring monetary asset and liability accounts that are denominated in a currency other than a subsidiary's functional currency are included in net foreign exchange gain and loss and are included in net income except for those intercompany balances that are long-term investments in nature. The translation gain or losses from the long-term investment nature of intercompany balances are treated as translation adjustments and included in comprehensive income.

4. *Fair Value*

The carrying value of cash, cash equivalents and short-term investments, accounts receivable, accounts payable, and note receivable approximate their historical fair values due to their short-term maturities. The carrying value of the debt approximates its fair value due to the short-term nature of the debt since it renews frequently at current interest rates. Management believes that the interest rates in effect at each year end represent the current market rates for similar borrowings.

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The fair value measurement standard defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The standard characterizes inputs used in determining fair value according to a hierarchy that prioritized inputs based on the degree to which they are observable. The three levels of the fair value hierarchy are as follows:

Level 1—Inputs represent quoted prices in active markets for identical assets or liabilities.

Level 2—Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3—Inputs that are not observable from objective sources, such as management's internally developed assumptions used in pricing an asset or liability.

Assets and liabilities that are required to be fair valued on a recurring basis include money market funds, marketable securities, equity instruments and contingent consideration.

Money market funds are valued with Level 1 inputs, using quoted market prices, and are included in cash and cash equivalents on the Company's consolidated balance sheets.

5. *Cash and Cash Equivalents*

The Company considers all highly liquid securities with an original maturity of ninety days or less from the date of purchase to be cash equivalents. Cash in foreign accounts was approximately \$17.5 \$17.7 million and \$17.3 \$17.5 million at December 31, 2022 2023 and 2021 2022, respectively.

The Company maintains cash and cash equivalents at U.S. financial institutions for which the combined account balances in individual institutions may exceed Federal Deposit Insurance Corporation ("FDIC") insurance coverage and, as a result, there is a concentration of credit risk related to amounts on deposit in excess of FDIC insurance coverage. As of December 31, 2022 2023, approximately \$18.3 \$36.8 million of U.S. deposits were not covered by FDIC insurance. The Company has not experienced any losses and believes it is not exposed to any significant risk with such accounts.

6. *Restricted Cash/Compensating Balances*

Restricted cash includes guarantee deposits for customs duties and compensating balances associated with credit facilities.

7. *Accounts Receivable/Allowance for Doubtful Accounts*

The Company carries its accounts receivable at the net amount that it estimates to be collectible. An allowance for uncollectable accounts is maintained through a charge against operations. The allowance is determined by management review of outstanding amounts per customer, historical payments and the aging of accounts.

8. *Concentration of Credit Risk and Significant Customers*

Financial instruments which potentially subject the Company to concentrations of credit risk include cash, cash equivalents and accounts receivable. The Company places all cash and cash equivalents with high-credit quality financial institutions.

The Company performs ongoing credit valuations of its customers' financial condition whenever deemed necessary and generally does not require deposits or collateral to support customer receivables. The historical amount of losses on uncollectible accounts has been within the Company's estimates. The Company generates much of its revenue from a limited number of customers. In 2022, 2023, 2021 2022 and 2020 2021, its top five customers represented 78.2% 85.6%, 67% 78.2%, and 73.3% 67% of its revenue,

respectively. In 2022 2023, Microsoft, ATX and Digicomm represented 46.6%, 15.6% and 11.3% of its revenue, respectively. In 2022, ATX and Microsoft represented 47.3% and 18.4% of its revenue, respectively. In 2021, ATX, Microsoft and Cisco represented 25.6%, 14.1% and 11.9% of its revenue, respectively. revenue.

The five largest receivable balances for customers represented an aggregate of 86.9% 75.4% and 70.6% 86.9% of total accounts receivable at December 31, 2022 2023 and 2021 2022, respectively. As of December 31, 2022 2023, Digicomm represented 35.2% of total accounts receivable and ATX represented 64.9% 21.4% of total accounts receivable. As of December 31, 2021, 2022, ATX and Microsoft represented 41.7%, and 13.3% 64.9% of total accounts receivable, respectively. No other customer represented greater than ten percent of revenue in 2022, 2021 2023 or 2020 2022 had greater than ten percent of total accounts receivable at December 31, 2022 2023 or 2021, 2022.

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9. Inventories

Inventories are stated at the lower of cost (average-cost method) or net realizable value. Work in process and finished goods includes materials, labor and allocated overhead. The Company assesses the valuation of its inventory on a periodic basis and provides write-offs for the value of estimated excess and obsolete inventory based on estimates of future demand. Inventory reserves are recorded to account for the excess and obsolete inventory combined with the lower of cost or net realizable value assessments. To develop the reserve, the Company developed certain percentages that determine the extent of inventory reserve adjustments based on the age of the inventory. Such percentages were determined through analysis of the inventory to determine each product's lifespan, a review historical write-offs or scrapped inventory, and an assessment by product engineers of the possibility of obsolescence for each product.

10. Property, Plant and Equipment

Property, plant and equipment are stated at cost, net of accumulated depreciation and amortization. The Company calculates depreciation using the straight-line method over the following estimated useful lives:

	Useful lives (in years)
Buildings	20 - 42
Land improvements	10
Machinery and equipment	2 - 20
Furniture and fixtures	3 - 7
Computer equipment and software	3 - 10
Leasehold improvements	The shorter of the life of the applicable lease or the useful life of the improvement
Transportation equipment	5

Major improvements are capitalized and expenditures for maintenance and repairs are expensed as incurred. Construction in progress represents property, plant and equipment under construction or being installed. Costs include original cost, installation, construction and other direct costs which include interest on borrowings used to finance the asset. Construction in progress is transferred to the appropriate fixed asset account and depreciation commences when the asset has been substantially completed and placed in service.

Land use rights allow the Company rights for 50 years to certain land in Ningbo, China on which the Company built a facility that included office space, manufacturing operations and employee dormitories. The land use rights are recorded at cost and are amortized on the straight-line basis over the useful life of the related contract. The land use rights expire on October 7, 2054 and December 28, 2067.

11. Intangible Assets

Intangible assets consist of intellectual property that is stated at cost less accumulated amortization. As of December 31, 2022 2023, the Company had 304 326 total patents issued. The costs incurred to obtain such patents have been capitalized and are being amortized over an estimated life between 10 and 20 years. The Company periodically evaluates its intangible assets to determine whether events or changes in circumstances indicate that a patent or trademark may not be applicable to the Company's current products or is no longer in use. If such a determination is made, the intangible asset is impaired and the remaining value of the patent or trademark will be expensed at that time.

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12. Impairment of Long-Lived Assets

The Company accounts for impairment of long-lived assets in accordance with Accounting Standards Codification ("ASC") 360, *Property, Plant and Equipment*, ("ASC 360"). Long-lived assets consist primarily of property, plant and equipment, right-of-use assets and intangible assets. In accordance with ASC 360, the Company evaluates the carrying value of long-lived assets when it determines a triggering event has occurred, or whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. When indicators exist, recoverability of assets is measured by a comparison of the carrying value of the asset group to the estimated undiscounted future net cash flows expected to be generated by the **asset, asset group**. Examples of such triggering events include a significant disposal of a portion of such assets, an adverse change in the market involving the business employing the related asset, a significant decrease in the benefits realized from an acquired business, difficulties or delays in integrating the business, and a significant change in the operations of an acquired business. If such assets are determined not to be recoverable, the Company performs an analysis of the fair value of the asset group and will recognize an impairment loss when the fair value is less than the carrying amounts of such assets. The fair value, based on reasonable and supportable assumptions and projections, require subjective judgments. Depending on the assumptions and estimates used, the appraised fair value projected in the evaluation of long-lived assets can vary within a range of outcomes. The Company considers the likelihood of possible outcomes in determining the best estimate for the fair value of the assets. The Company did not record any asset impairment charges in **2022** **2023**, **2021** **2022** or **2020**, **2021**.

13. Comprehensive Income (Loss)

ASC 220, *Comprehensive Income*, ("ASC 220") establishes rules for reporting and display of comprehensive income (loss) and its components. ASC 220 requires that unrealized gains and losses on the Company's foreign currency translation adjustments be included in comprehensive income (loss).

14. Share-based Compensation

The Company accounts for share-based compensation in accordance with the provisions of ASC 718, *Compensation—Stock Compensation*. Share-based compensation expense is recognized based on the grant date fair value in order to recognize compensation cost for those shares expected to vest. Compensation cost is recognized on a straight-line basis over the vesting period of the restricted stock units and adjusted as forfeitures occur.

15. Revenue Recognition

The Company derives revenue from the manufacture and sale of fiber optic networking products. Revenue recognition follows the criteria of ASC 606, *Revenue from Contracts with Customers*. Specifically, the Company recognizes revenue when obligations under the terms of a contract with its customer are satisfied; generally this occurs with the transfer of control of products or services at point of time or over times. When the **company Company** receives payments and its obligations to customers are not satisfied, the **company Company** will recognize the payment as **Deferred Unearned** Revenue from customers.

16. Product Warranty

The Company generally offers a one-year limited warranty for its products but it can extend for longer periods of three to five years for certain products sold to certain customers. The Company estimates the costs that may be incurred under its basic limited warranty and records a liability for the amount of such costs at the time when product defects occur. Factors that affect the Company's warranty liability include the historical and anticipated rates of warranty claims and cost to repair. While the Company believes that its warranty accrual is adequate, the actual warranty costs may exceed the accrual, in which case the cost of sales will increase in the future. As of December 31, **2022** **2023** and **2021** **2022**, the amount of accrued warranty was **\$0.1** **\$0.25** million and **\$0.3** **\$0.1** million, respectively. Changes in products warranty were as follows (in thousands):

	Year ended December 31,		Year ended December 31,	
	2022	2021	2023	2022
Beginning Balance, January 1	\$ 263	\$ 703	\$ 140	\$ 263
Warranty costs incurred	(85)	(826)	(44)	(85)
Provision for warranty	(38)	386	159	(38)
Ending Balance, December 31	\$ 140	\$ 263	\$ 255	\$ 140

17. Advertising Costs

Advertising costs are charged to operations as incurred and amounted to approximately \$0.8 million, \$0.1\$0.8 million, and \$0.4\$0.1 million for the years ended December 31, 2022, 2023, 2021 2022 and 2020 2021, respectively.

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18. Research and Development

Research and development costs are charged to operations as incurred. The Company receives reimbursement for certain development costs, which offset with expense up to the reimbursable amount.

19. Shipping and Handling Costs

Shipping and handling costs are included in operating expenses as fulfillment costs unless we bill our customers for shipping and handling charges, which are included in net sales for the applicable period, and the corresponding shipping and handling expense is reported in cost of sales.

20. Income Taxes

The Company accounts for income taxes in accordance with the provisions of ASC 740, *Income Taxes*. The liability method is used to account for deferred income taxes. Under the liability method, deferred tax assets and liabilities are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The ability to realize deferred tax assets is evaluated annually and a valuation allowance is provided if it is unlikely that the deferred tax assets will not give rise to future benefits in the Company's tax returns.

The Company records uncertain tax positions in accordance with ASC 740 on the basis of a two-step process in which (1) it determines whether it is more likely than not that the tax positions will be sustained on the basis of the technical merits of the position and (2) for those tax positions that meet the more-likely-than-not recognition threshold, it recognizes the largest amount of tax benefit that is more than 50% likely to be realized upon ultimate settlement with the related tax authority.

The Company recognizes interest and penalties related to unrecognized tax benefits on the income tax expense line in the accompanying consolidated statement of operations. Accrued interest and penalties are included on the related tax liability line in the consolidated balance sheet.

21. Global Intangible Low-taxed Income Provisions ("GILTI")

One of the base broadening provisions of the U.S. Tax Cuts and Jobs Act of 2017 ("the 2017 Act") is the global intangible low-taxed income provisions ("GILTI"). In accordance with guidance issued by the FASB staff, the Company has adopted an accounting policy to treat any GILTI inclusions as a period cost if and when incurred. Thus, for the fiscal years ended December 31, 2022, 2023, December 31, 2021, 2022, and December 31, 2020, 2021, deferred taxes were computed without consideration of the possible future impact of the GILTI provisions, and any current year impact was recorded as a part of the current portion of income tax expense.

22. Recent Accounting Pronouncements

Recent Accounting Pronouncements Adopted in 2022 2023

There was no accounting pronouncement adopted in 2022, 2023.

Recent Accounting Pronouncements Adopted in 2021

In March 2020, the FASB issued ASU 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting", which provides temporary optional expedients and exceptions to the GAAP guidance on contract modifications and hedge accounting to ease the financial reporting burdens related to the expected market transition from the London Interbank Offered Rate ("LIBOR") and other interbank offered rates to alternative reference rates. This ASU is effective beginning on March 12, 2020 and the Company may elect to apply the amendments prospectively through December 31, 2022. The Company adopted this ASU on January 1, 2021, with no impact on its consolidated financial statements

In August 2020, the FASB issued ASU 2020-06, "Debt - Debt with Conversion and Other Options (Subtopic 470-20)" and "Derivatives and Hedging - Contracts in Entities Own Equity" (Subtopic 815-40). This ASU simplifies accounting for convertible instruments by eliminating two of the three models in ASC 470-20 that requires separating embedded conversion features from convertible instruments. The Company adopted this ASU on January 1, 2021, with no impact on its consolidated financial statements.

In November 2020, the SEC issued a new rule that modernizes and simplifies various aspects and financial disclosure requirements in Regulation S-K, specifically related to Item 301 "Selected Financial Data", Item 302 "Supplementary Financial Information" and Item 303 "Management's Discussion and Analysis of Financial Condition and Results of Operations" ("MD&A"). The intent of this new rule is to (i) eliminate duplicative disclosures, (ii) enhance and promote more principles-based MD&A disclosures with the objective of making them more meaningful for investors, all while (iii) simplifying the compliance requirements and efforts for registrants, by providing them with the flexibility to present management's perspective on the registrant's financial condition and results of operations. While most of the changes involve reducing or eliminating previously required information and disclosures, the rule does expand the disclosure requirements surrounding certain aspects of the various items in Regulation S-K discussed above. The final rule was published in the Federal Register on January 11, 2021, is effective thirty days after its publication date, or February 10, 2021, and registrants are required to comply with this final rule in the registrant's first fiscal year ending on or after the date that is 210 days after the publication date. The Company evaluated this SEC final rule, which was adopted and incorporated in this filing, and it did not have a material impact on this current SEC filing nor is it expected to have a material impact on future SEC filings.

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Recent Accounting Pronouncements Yet to be Adopted

To date, there have been in no December 2023, the FASB issued ASU 2023-09 recent accounting pronouncement Income Taxes (Topic not 740 yet): Improvements to Income Tax Disclosures", which requires the Company to disclose disaggregated jurisdictional and categorical information for the tax rate reconciliation, income taxes paid and other income tax related amounts. This guidance is effective that have significance, or potential significance, for annual periods beginning after December 15, 2024, with early adoption permitted. The adoption is expected to our enhance the Company's Notes to the Consolidated Financial Statements. The Company is currently evaluating the impact the new standard will have on its financial statements and related disclosure.

In November 2023, the FASB issued ASU 2023-07 "Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures", which requires the Company to expand the breadth and frequency of segment disclosures to include additional information about significant segment expenses, the chief operating decision maker (CODM) and other items, and also require the annual disclosures on an interim basis. This guidance is effective for annual periods beginning after December 15, 2023, with early adoption permitted. The Company is currently evaluating the impact the new standard will have on its financial statements and related disclosure.

In October 2023, the FASB issued ASU 2023-06 "Codification Amendments in Response to the SEC's Disclosure Update and Simplification Initiative", which amends U.S. GAAP to include 14 disclosure requirements that are currently required under SEC Regulation S-X or Regulation S-K. Each amendment will be effective on the date on which the SEC removes the related disclosure requirement from SEC Regulation S-X or Regulation S-K. The Company has evaluated the new standard and determined that it will have no material impact on its financial statements or disclosures since the Company is already subject to the relevant SEC disclosure requirements.

NOTE C—REVENUE RECOGNITION

Revenue from Contracts with Customers

The Company derives revenue from the manufacture and sale of fiber optic networking products. Revenue is recognized when obligations under the terms of a contract with its customer are satisfied; generally this occurs with the transfer of control of products or services. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products or providing services. Certain customers may receive cash and/or non-cash incentives, which are accounted for as variable consideration. To achieve this core principle, the Company applies the following five steps:

1. Identify the contract with a customer

A contract with a customer exists when (i) the Company enters into an agreement with a customer that defines each party's rights regarding the products or services to be transferred and identifies the payment terms related to these products or services, (ii) both parties to the contract are committed to perform their respective obligations, (iii) the contract has commercial substance, and (iv) the Company determines that collection of substantially all consideration for products or services that are transferred is probable based on the customer's intent and ability to pay the promised consideration. The Company applies judgment in determining the customer's ability and intention to pay, which is based on a variety of factors including the customer's payment history or, in the case of a new customer, published credit and financial information pertaining to the customer.

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2. Identify the performance obligations in the contract

Performance obligations promised in a contract are identified based on the products or services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the product or service either on its own or together with other resources that are readily available from third parties or from the Company, and are distinct in the context of the contract, whereby the transfer of the products or services is separately identifiable from other promises in the contract. To the extent a contract includes multiple promised products or services, the Company must apply judgment to determine whether promised products or services are capable of being distinct and

distinct in the context of the contract. If these criteria are not met, the promised products or services are accounted for as a combined performance obligation. The Company has elected to account for shipping and handling activities as a fulfillment cost as permitted by the standard.

3. Determine the transaction price

The transaction price is determined based on the consideration to which the Company will be entitled in exchange for transferring products or services to the customer. To the extent the transaction price is variable, revenue is recognized at an amount equal to the consideration to which the Company expects to be entitled. This estimate includes customer sales incentives which are accounted for as a reduction to revenue and estimated using either the expected value method or the most likely amount method, depending on the nature of the program. The Company will adjust its consideration for any rebates if it is more likely than not that the rebate conditions will be met.

4. Allocate the transaction price to performance obligations in the contract

If the contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation based on a relative standalone selling price basis unless a portion of the variable consideration related to the contract is allocated entirely to a for each performance obligation. The Company determines standalone selling price based on the price at which the performance obligation is sold separately. The company recognizes revenues over times

In cases where there is no directly observable stand alone selling price, allowable estimation methods are used. For example for services obligations. Based on ASC 606-10-32-34 methods, contracts involving non-recurring engineering, an expected cost plus a margin approach is has typically been adopted to allocate estimate the transaction standalone selling price.

5. Recognize revenue when or as the Company satisfies a performance obligation

The For product sales, the Company generally satisfies performance obligations at a point in time. Revenue time, most often upon shipment of a product to the customer or delivery of the product to the customer. In the case of such point in time satisfaction of a performance obligation, revenue is recognized based on the transaction price at the time the related performance obligation is satisfied satisfied.

For service obligations, the Company generally recognizes revenue over time. The most common type of service obligation encountered by transferring the Company is an arrangement involving non-recurring engineering in which service revenue is typically recognized over time under either the time and material practical expedient, as the Company has a promised product right to consideration from a customer, in an amount that corresponds directly with the value to the customer of the Company's performance completed to date, or service under the output method, for example using contract-specific milestones or other objective measures of progress.

Unearned Revenue

Unearned Revenue results from cash received or amounts billed to a customer, customers in advance of revenue recognized upon the satisfaction of performance obligations. As of December 31, 2023, and 2022, the Company had Unearned Revenue of \$1.8 million and \$3 million, respectively. The following table reflects the changes in Unearned Revenue in our consolidated financial statements for the periods indicated (in thousands). The remaining \$1.8 million will be expected to be recognized as revenue gradually in 2024, depending on the customer's request.

	December 31, 2023	December 31, 2022
Unearned Revenue, beginning of period	\$ 3,000	\$ —
Additional Unearned Revenue	12,608	3,000
Revenue recognized	13,805	—
Unearned Revenue, end of period	<u>\$ 1,803</u>	<u>\$ 3,000</u>

Disaggregation of Revenue

Revenue is classified based on the location of where the product is manufactured. For additional information on the disaggregated revenues by geographical region, see Note R, "Segments and Geographic Information."

Revenue is also classified by major product category and is presented below (in thousands):

	Years ended December 31,						Years ended December 31,					
	2022	% of Revenue	2021	% of Revenue	2020	% of Revenue	2023	% of Revenue	2022	% of Revenue	2021	% of Revenue
CATV	\$ 118,169	53.0 %	\$ 94,266	44.6 %	\$ 37,944	16.2 %	\$ 59,942	27.5 %	\$ 118,169	53.0 %	\$ 94,266	44.6 %
Data Center	77,094	34.6 %	97,461	46.1 %	173,437	73.9 %	141,213	64.9 %	77,094	34.6 %	97,461	46.1 %
Telecom	24,727	11.1 %	16,247	7.7 %	21,092	9.0 %	13,831	6.4 %	24,727	11.1 %	16,247	7.7 %
FTTH	129	0.1 %	957	0.5 %	110	0.0 %	56	0.0 %	129	0.1 %	957	0.5 %
Other	2,699	1.2 %	2,634	1.2 %	2,040	0.9 %	2,604	1.2 %	2,699	1.2 %	2,634	1.2 %

Total	\$ 222,818	100.0%	\$ 211,565	100.0%	\$ 234,623	100.0%	\$ 217,646	100.0%	\$ 222,818	100.0%	\$ 211,565	100.0%
Revenue												

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NOTE D— LEASES

The Company leases space under non-cancellable operating leases for manufacturing facilities, research and development offices and certain storage facilities and apartments. These leases do not contain contingent rent provisions. The Company also leases certain machinery, office equipment and a vehicle under operating leases. Many of its leases include both lease (e.g. fixed payments including rent, taxes, and insurance costs) and non-lease components (e.g. common-area or other maintenance costs) which are accounted for as a single lease component as the Company has elected the practical expedient to group lease and non-lease components for all leases. Several of the leases include one or more options to renew which have been assessed and either included or excluded from the calculation of the lease liability of the ROU asset based on management's intentions and individual fact patterns. Several warehouses and apartments have non-cancellable lease terms of less than one-year and therefore, the Company has elected the practical expedient to exclude these short-term leases from its ROU asset and lease liabilities.

As most of the Company's leases do not provide an implicit rate, the Company uses its incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. Based on the applicable lease terms and current economic environment, the Company applies a location approach for determining the incremental borrowing rate.

Lease expense is included under general and administrative expenses and was \$1.2 million, **\$1.3** **\$1.2** million, and **\$1.4** **\$1.3** million, respectively, for the years ended December 31, **2022**, **2023**, **2021** **2022** and **2020** **2021**, respectively. The Components of lease expense were as follows for the periods indicated (in thousands):

	Year ended December 31, 2022	Year ended December 31, 2021	Year ended December 31, 2023	Year ended December 31, 2022
Operating lease expense	\$ 1,161	\$ 1,230	\$ 1,146	\$ 1,161
Financing lease expense	32	32	27	32
Short Term lease expense	27	19	22	27
Total lease expense	\$ 1,220	\$ 1,281	\$ 1,195	\$ 1,220

Maturities of lease liabilities are as follows for the future one-year periods ending December 31, (in thousands):

	Operating	Financing	Total	Operating	Financing	Total
2023	\$ 1,237	\$ 65	1,302			
2024	1,127	—	1,127	\$ 1,330	\$ —	\$ 1,330
2025	1,207	—	1,207	1,307	—	1,307
2026	1,078	—	1,078	1,106	—	1,106
2027	1,084	—	1,084	1,092	—	1,092
2028 and thereafter	1,551	—	1,551			
2028				1,093	—	1,093
2029 and thereafter				463	—	463
Total lease payments	\$ 7,284	\$ 65	7,349	\$ 6,391	\$ —	\$ 6,391
Less imputed interest	(738)	(2)	(740)	(516)	—	(516)
Present value	\$ 6,546	\$ 63	6,609	\$ 5,875	\$ —	\$ 5,875

The weighted average remaining lease term and discount rate for operating leases were as follows for the periods indicated:

December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022

Weighted Average Remaining Lease Term (Years) - operating leases	6.16	7.15	5.10	6.16
Weighted Average Remaining Lease Term (Years) - financing leases	0.83	1.83	—	0.83
Weighted Average Discount Rate - operating leases	3.21 %	3.22 %	3.30 %	3.21 %
Weighted Average Discount Rate - financing leases	5.00 %	5.00 %	—	5.00 %

Supplemental cash flow information related to operating leases was as follows for the periods indicated (in thousands):

	Year ended December 31, 2022	Year ended December 31, 2021	Year ended December 31, 2023	Year ended December 31, 2022
Cash paid for amounts included in the measurement of lease liabilities:				
Operating cash flows from operating leases	1,234	1,287	1,250	1,234
Operating cash flows from financing lease	4	5	2	4
Financing cash flows from financing lease	19	18	63	19
Right-of-use assets obtained in exchange for new operating lease liabilities	-	124	-	—

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NOTE E—CASH, CASH EQUIVALENTS AND RESTRICTED CASH

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the balance sheet that sum to the total of the same such amounts in the statement of cash flows (in thousands):

	December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022
Cash and cash equivalents	\$ 24,685	\$ 34,656	\$ 45,366	\$ 24,685
Restricted cash	10,902	6,480	9,731	10,902
Total cash, cash equivalents and restricted cash shown in the statement of cash flows	\$ 35,587	\$ 41,136	\$ 55,097	\$ 35,587

Restricted cash includes guarantee deposits for customs duties, China government subsidy fund, and compensating balances associated with certain credit facilities. As of December 31, 2022 2023 and 2021 2022, there was \$8.7 \$6.5 million and \$3.0 \$8.7 million of restricted cash required for bank acceptance notes issued to vendors, respectively. There was \$1.1 \$2.5 million and \$2.4 \$1.1 million certificate of deposit with original maturity of 90 days or less associated with credit facilities with a bank in China as of December 31, 2022 2023 and 2021 2022 respectively. There was \$0.7 million and \$1.0 million guarantee deposits for customs duties as of December 31, 2022 2023 and December 31, 2021 2022.

NOTE F—EARNINGS PER SHARE

Basic net loss per share has been computed using the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per share has been computed using the weighted-average number of shares of common stock and dilutive potential common shares from options and restricted stock units outstanding during the period. In periods with net losses, normally dilutive shares become anti-dilutive. Therefore, basic and dilutive earnings per share are the same.

The following table presents the computation of the basic and diluted net loss per share for the periods indicated (in thousands):

	Year ended December 31,		
	2022	2021	2020
Numerator:			

Net loss	\$	(66,397)	\$	(54,162)	\$	(58,452)
Denominator:						
Weighted average shares used to compute net loss per share						
Basic		27,846		26,912		21,867
Effect of dilutive options and restricted stock units		—		—		—
Diluted		27,846		26,912		21,867
Net loss per share						
Basic	\$	(2.38)	\$	(2.01)	\$	(2.67)
Diluted	\$	(2.38)	\$	(2.01)	\$	(2.67)

	Year ended December 31,					
	2023	2022	2021			
Numerator:						
Net loss	\$	(56,048)	\$	(66,397)	\$	(54,162)
Denominator:						
Weighted average shares used to compute net loss per share						
Basic		31,944		27,846		26,912
Effect of dilutive options and restricted stock units		—		—		—
Diluted		31,944		27,846		26,912
Net loss per share						
Basic	\$	(1.75)	\$	(2.38)	\$	(2.01)
Diluted	\$	(1.75)	\$	(2.38)	\$	(2.01)

The following potentially dilutive securities were excluded from diluted net loss per share as their effect would have been antidilutive (in thousands):

	As of December 31,		As of December 31,	
	2022	2021	2023	2022
Employee stock options	-	3	-	-
Restricted stock units	1	3	1,167	1
Shares for convertible senior notes	4,587	4,587	5,264	4,587
Total antidilutive shares	4,588	4,593	6,431	4,588

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NOTE G—INVENTORIES

At December 31, 2022, 2023 and 2021, inventories consisted of the following (in thousands):

	As of December 31,		As of December 31,	
	2022	2021	2023	2022
Raw materials	\$ 25,732	\$ 29,469	\$ 22,128	\$ 25,732
Work in process and sub-assemblies	39,563	41,528	33,792	39,563
Finished goods	14,384	21,519	22,452	26,794
Allowance for Inventory			(14,506)	(12,410)
Total inventory	\$ 79,679	\$ 92,516	\$ 63,866	\$ 79,679

For the years ended December 31, 2023, 2022, 2021 and 2020, 2021, the inventory reserve adjustment expensed for inventory was \$4.9 \$8.7 million, \$3.9 million \$4.9 million, and \$3.9 million, respectively. For the years December 31, 2022, 2023, 2021, 2022 and 2020, 2021, the direct inventory write-offs related to scrap, discontinued products, and

damaged inventories were \$10.6 million, \$10.4 million, and \$16.8 million, and \$20.4 million, respectively.

NOTE H—PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consisted of the following for the periods indicated (in thousands):

	December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022
Land improvements	\$ 806	\$ 806	\$ 806	\$ 806
Building and improvements	86,372	89,698	86,534	86,372
Machinery and equipment	251,216	266,386	257,842	251,216
Furniture and fixtures	5,382	5,658	5,449	5,382
Computer equipment and software	11,713	12,727	12,059	11,713
Transportation equipment	679	726	673	679
	356,168	376,001	363,363	356,168
Less accumulated depreciation and amortization	(177,519)	(167,772)	(194,086)	(177,519)
	178,649	208,229	169,277	178,649
Construction in progress	30,434	33,705	29,939	30,434
Land	1,101	1,101	1,101	1,101
Total property, plant and equipment, net	\$ 210,184	\$ 243,035	\$ 200,317	\$ 210,184

For the years ended December 31, 2022, 2023, 2021 2022 and 2020 2021, depreciation expense of property, plant and equipment was \$19.7 million, \$22.6 million, \$24.8 million, and \$24.2 \$24.8 million, respectively. For the years December 31, 2022, 2023, 2021 2022 and 2020 2021, the capitalized interest was \$0 million, \$0.2 million, \$0.9 million, and \$0.4 \$0.9 million, respectively.

As of December 31, 2022 2023, the Company concluded that its continued loss history constitutes a triggering event as described in ASC 360-10-35-21, *Property, Plant, and Equipment*. The Company performed a recoverability test and concluded that future undiscounted cash flows exceed the carrying amount of the Company's long-lived assets and therefore no impairment charge was recorded.

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NOTE I—INTANGIBLE ASSETS

Intangible assets consisted of the following for the periods indicated (in thousands):

	December 31, 2022			December 31, 2023		
	Gross Amount	Accumulated amortization	Intangible assets, net	Gross Amount	Accumulated amortization	Intangible assets, net
Patents	\$ 8,994	\$ (5,330)	\$ 3,664	\$ 9,502	\$ (5,981)	\$ 3,521
Trademarks	56	(21)	35	138	(31)	107
Total intangible assets	\$ 9,050	\$ (5,351)	\$ 3,699	\$ 9,640	\$ (6,012)	\$ 3,628

	December 31, 2021			December 31, 2022		
	Gross Amount	Accumulated amortization	Intangible assets, net	Gross Amount	Accumulated amortization	Intangible assets, net
Patents	\$ 8,597	\$ (4,779)	\$ 3,818	\$ 8,994	\$ (5,330)	\$ 3,664
Trademarks	35	(17)	18	56	(21)	35
Total intangible assets	\$ 8,632	\$ (4,796)	\$ 3,836	\$ 9,050	\$ (5,351)	\$ 3,699

For the years ended December 31, 2022, 2023, 2021 2022 and 2020 2021, amortization expense for intangible assets, included in general and administrative expenses on the income statement, was \$0.7 million, \$0.6 million \$0.5 million and \$0.5 million, \$0.5 million, respectively. The remaining weighted average amortization period for intangible assets is approximately six years.

At December 31, 2022 2023, future amortization expense for intangible assets is estimated to be (in thousands):

	December 31, 2022
2023	\$ 627
2024	627
2025	627
2026	627
2027	627
2028	564
thereafter	-
Total	\$ 3,699

	December 31, 2023
2024	\$ 683
2025	683
2026	683
2027	683
2028	683
2029	213
thereafter	-
Total	\$ 3,628

NOTE J—FAIR VALUE OF FINANCIAL INSTRUMENTS

The following table presents a summary of the Company's financial instruments measured at fair value on a recurring basis as of December 31, 2022 2023 (in thousands):

	Quoted prices in active markets for identical assets (Level 1)	Significant other observable remaining inputs (Level 2)	Significant unobservable inputs (Level 3)	Total	Quoted prices in active markets for identical assets (Level 1)	Significant other observable remaining inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Assets:								
Cash and cash equivalents	\$ 24,685	\$ —	\$ —	\$ 24,685	\$ 45,366	\$ —	\$ —	\$ 45,366
Restricted cash	10,902	—	—	10,902	9,731	—	—	9,731
Note receivable	—	339	—	339	—	219	—	219
Total assets	\$ 35,587	\$ 339	\$ —	\$ 35,926	\$ 55,097	\$ 219	\$ —	\$ 55,316
Liabilities:								
Bank acceptance payable	—	\$ 12,337	—	\$ 12,337	—	\$ 15,482	—	\$ 15,482
Convertible senior notes	—	58,314	—	58,314	—	76,519	—	76,519
Total liabilities	\$ —	\$ 70,651	\$ —	\$ 70,651	\$ —	\$ 92,001	\$ —	\$ 92,001

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The following table presents a summary of the Company's financial instruments measured at fair value on a recurring basis as of December 31, 2021 2022 (in thousands):

	Quoted prices in active markets for identical assets (Level 1)	Significant other observable remaining inputs (Level 2)	Significant unobservable inputs (Level 3)	Total	Quoted prices in active markets for identical assets (Level 1)	Significant other observable remaining inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Assets:								
Cash and cash equivalents	\$ 34,656	\$ —	\$ —	\$ 34,656	\$ 24,685	\$ —	\$ —	\$ 24,685
Restricted cash	6,480	—	—	6,480	10,902	—	—	10,902
Note receivable	—	8,148	—	8,148	—	339	—	339
Total assets	<u>\$ 41,136</u>	<u>\$ 8,148</u>	<u>\$ —</u>	<u>\$ 49,284</u>	<u>\$ 35,587</u>	<u>\$ 339</u>	<u>\$ —</u>	<u>\$ 35,926</u>
Liabilities:								
Bank acceptance payable	—	\$ 8,198	—	\$ 8,198	—	\$ 12,337	—	\$ 12,337
Convertible senior notes	—	67,588	—	67,588	—	58,314	—	58,314
Total liabilities	<u>\$ —</u>	<u>\$ 75,786</u>	<u>\$ —</u>	<u>\$ 75,786</u>	<u>\$ —</u>	<u>\$ 70,651</u>	<u>\$ —</u>	<u>\$ 70,651</u>

NOTE K—NOTES PAYABLE AND LONG-TERM DEBT

Notes payable and long-term debt consisted of the following for the periods indicated (in thousands):

	December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022
Revolving line of credit with a U.S. bank up to \$20,000 with interest at 4.063% , matured November 16, 2022	—	\$ 14,373		
Notes payable to a finance company due in monthly installments with 3.1% interest, matured January 21, 2022	—	170		
Revolving line of credit with a U.S. bank up to \$27.8 million with interest at 8.984%, maturing the earlier of either 12/14/2023 or 11/16/2025 if the convertible debt remained in effect	25,000	—		
Revolving line of credit with a China bank up to \$19,902 with interest from 2.95% to 4.57%, maturing May 24, 2024	13,102	19,595		
Credit facility with a China bank up to \$26,636 with interest of 4.45% ~ 6.6%, maturing June 7, 2027	20,140	13,044		
Credit facility with a China bank up to \$7,167 with interest of 5.7%, matured June 27, 2022		7,529		
Revolving line of credit with a U.S. bank up to \$27.8 million with interest at 8.984%, maturing the earlier of either 12/14/2023 or 11/16/2025 if the convertible debt remained in effect			—	\$ 25,000
Revolving line of credit with a China bank up to \$19.04 million with interest from 4.57% to 6.12%, maturing May 24, 2024			12,608	13,102
Credit facility with a China bank up to \$26.65 million with interest of 4.45% to 6.6%, maturing June 6, 2027			10,589	20,140
Sub-total	58,242	54,711	23,197	58,242
Less debt issuance costs, net	(1,168)	(22)	—	(1,168)
Grand total	57,074	54,689	23,197	57,074
Less current portion	(57,074)	(49,689)	(23,197)	(57,074)
Non-current portion	<u>\$ -</u>	<u>\$ 5,000</u>	<u>\$ -</u>	<u>\$ -</u>
Bank Acceptance Notes Payable				

Bank acceptance notes issued to vendors with a zero percent interest rate	\$	12,337	\$	8,198	\$	15,482	\$	12,337
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The current portion of long-term debt is the amount payable within one year of the balance sheet date of December 31, ~~2022~~ 2023.

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On September 28, 2017, the Company entered into a Loan Agreement ("Loan Agreement"), a Promissory Note, an Addendum to the Promissory Note, a Trust Bank Security Agreement, a Trademark Security Agreement, and a Patent Security Agreement (together the "Credit Facility") with Trust Bank. The Company's obligations under the Credit Facility are secured by the Company's accounts receivable, inventory, intellectual property, and all business assets with the exception of real estate and equipment. The Company amended the Loan Agreement on December 29, 2021.

On December 29, 2021, the Company executed a Sixth Amendment to the Loan Agreement (the "Sixth Amendment") and a Fifth Amendment to Security Agreement, a Note Modification Agreement, and an Addendum to Promissory Note (together the "Sixth Amended Credit Facility") with Trust Bank. The Sixth Amended Credit Facility extends the \$20 million line of credit, originally entered into on September 28, 2017, until April 15, 2023. Borrowings will bear interest at a rate equal to the Secured Overnight Financing Rate (SOFR) plus 1.56%, with a SOFR floor of 0.75%. As of December 31, 2022, the Company has fully repaid loan under the Sixth Amended Credit Facility.

On November 16, 2022, the Company entered into a Loan Security and Guarantee Agreement (the "Credit Facility") with CIT Northbridge Credit, LLC, as agent for secured parties. The Credit Facility provides provided the Company with a three-year, \$27.78 million revolving line of credit. Borrowings under the Credit Facility will were to be used to repay senior debt with Trust Bank and for working capital needs, capital expenditures, and other corporate purposes. The Company's obligations under the Credit Facility are were secured by the Company's inventory, accounts receivable, instruments, equipment, intellectual property, and all business assets with the exception of real estate and all foreign assets. Borrowings will were to bear interest at a rate equal to the Secured Overnight Financing Rate (SOFR) plus 3.75%, while monthly average usage is was less than 50% of the Credit Facility, otherwise SOFR plus 4.75%. The Credit Facility will was to become due at the earlier date of either November 16, 2025 or 91 days prior to the maturity of the Convertible2024 Notes. As of On December 31, 2022, August 16, 2023, \$25.0 million was outstanding under the Company delivered a termination notice to CIT to terminate the Credit Facility.

On September 15, 2020, Prime World entered into an Amendment to As a result of the Finance Lease Agreements dated Company's delivery of such termination notice, the Credit Facility was terminated effective as of November 29, 2018 17, 2023 and January 21, 2019 (the "Amendment") with Chailease Finance Co., Ltd. ("Chailease"). The Amendment amends the Finance Lease Agreements, dated November 29, 2018 and January 21, 2019 (hereafter collectively referred to as the "Original Finance Agreements"). Pursuant to the Amendment, Prime World agrees to pay Chailease NT\$22,311,381, or approximately \$0.8 million for certain leased equipment listed in the Amendment (the "Leased Equipment"). This payment includes all outstanding lease payments, costs and expenses; simultaneously, Chailease agrees to transfer title of such Leased Equipment back to Prime World. Regarding all other equipment contemplated in the Original Finance Agreements but not listed in the Amendment, pursuant to the terms and conditions made under the Original Finance Agreements, Prime World is obligated to pay Chailease monthly lease payments which total NT\$159,027,448, or approximately \$5.5 million (the "Lease Payments"). The Lease Payments began on September 21, 2020 with the last Lease Payment due on January 21, 2022, title of all other equipment contemplated under the Original Finance Agreements but not listed in the Amendment transferred to Prime World upon completion of the Lease Payments and expiration of the Original Finance Agreements. As of December 31, 2022, the Company has was fully repaid the loan under the Original Finance Agreements and Amendment. repaid.

On May 24, 2019, the Company's China subsidiary, Global, entered into a five-year revolving credit line agreement, totaling 180,000,000 RMB (the "SPD Credit Line"), or approximately \$25.4 million, and a mortgage security agreement (the "Security Agreement"), with Shanghai Pudong Development Bank Co., Ltd ("SPD"). Borrowing under the SPD Credit Line will be used for general corporate and capital investment purposes, including the issuance of bank acceptance notes to Global's vendors. The total SPD Credit Line of 180 million RMB is inclusive of all credit facilities previously entered into with SPD including: a 30 million RMB credit facility entered into on May 7, 2019; and a 9.9 million RMB credit facility entered into on April 30, 2019 and \$2 million credit facility entered into on May 8, 2019. Global may draw upon the SPD Credit Line on an as-needed basis at any time during the 5-year term; however, draws under the SPD Credit Line may become due and repayable to SPD at SPD's discretion due to changes in Chinese government regulations and/or changes in Global's financial and operational condition. Each draw will bear interest equal to SPD's commercial banking interest rate effective on the day of the applicable draw. Global's obligations under the SPD Credit Line will be secured by real property owned by Global and mortgaged to the Bank under the terms of the Security Agreement. As of December 31, ~~2022, 2023~~, \$13.1 12.6 million was outstanding under the SPD Credit Line and the outstanding balance of bank acceptance notes issued to vendors was \$8.2 million.

On June 21, 2019, the Company's China subsidiary, Global, entered into an 18 month credit facility totaling 100,000,000 RMB (the "¥100M Credit Facility"), or approximately \$14.1 million, with China Zheshang Bank Co., Ltd., in Ningbo City, China ("CZB") \$12.5 million. Borrowing under the ¥100M Credit Facility will be used by Global for general corporate purposes. On January 6, 2021, the ¥100M Credit Facility with CZB was extended for three (3) years until January 5, 2024. The Company replaced the ¥100M Credit Facility on June 7, 2022.

On June 7, 2022, the Company's China Subsidiary, Global, entered a security agreement with China Zheshang Bank in Ningbo City, China ("CZB") for a five-year credit line agreement, totaling 200,000,000 RMB (the "¥200M Credit Facility"), or approximately \$29.9 million. Global may draw upon the ¥200M Credit Facility between June 7, 2022 and June 6, 2027 (" ¥200M Credit Period"). During the ¥200M Credit Period, Global may request to draw upon the ¥200M Credit Facility on an as-needed basis; however, draws under the ¥200M Credit Facility may become due and repayable to CZB at CZB's discretion due to changes in Chinese government regulations and/or changes in Global's financial and operational condition. Each draw will be facilitated by a separate credit agreement specifying the terms of each draw and will bear interest equal to CZB's commercial banking interest rate effective on the day of the applicable draw. Global's obligations under the ¥200M Credit Facility will be secured by real property owned by Global and mortgaged to CZB

under the terms of the Real Estate Security Agreement. On December 21, 2023, Global entered into an asset pool business cooperation agreement ("Asset Pool Agreement") and an asset pool pledge contract ("Pledge Contract") (referred to collectively as the Pledge Asset Line"), with CZB, which supplements the existing ¥200M Credit Facility. The Pledge Asset Line does not constitute a new credit line or an increase to the existing credit limits. Global may draw upon the Pledge Asset Line between December 21, 2023 and December 21, 2025 ("Asset Pool Period"). During the Asset Pool Period, Global may request to draw upon the Pledge Asset Line on an as-needed basis; however, amount of available credit under the Pledge Asset Line and approval of each draw may be reduced or declined by CZB due to changes in Chinese government regulations and/or changes in Global's financial and operational condition. Each draw will be facilitated by a separate credit agreement specifying the terms of each draw and will bear interest equal to CZB's commercial banking interest rate effective on the day of the applicable draw. Global's obligations under the Pledge Asset Line will be secured by certain financial assets, including but not limited to, deposit receipts, domestic accounts receivable and electronic commercial paper. As of December 31, 2022, 2023, \$20.1 10.6 million was outstanding under the ¥200M Credit Facility and the outstanding balance of bank acceptance notes issued to vendors was \$4.2 \$2.9 million.

On June 21, 2019, the Company's China subsidiary, Global, entered into a three-year credit facility totaling 50,000,000 RMB (the "¥50M Credit Facility"), or approximately \$7.1 million, with CZB. Borrowing under the ¥50M Credit Facility will be used by Global for general corporate purposes. Global may draw upon the ¥50M Credit Facility from June 21, 2019 until June 20, 2022 (the "¥50M Credit Period"). During the ¥50M Credit Period, Global may request to draw upon the ¥50M Credit Facility on an as-needed basis; however, draws under the ¥50M Credit Facility may become due and repayable to CZB at CZB's discretion due to changes in Chinese government regulations and/or changes in Global's financial and operational condition. Each draw will bear interest equal to CZB's commercial banking interest rate effective on the day of the applicable draw. Global's obligations under the ¥50M Credit Facility will be secured by machinery and equipment owned by Global and mortgaged to CZB under the terms of the Machinery and Equipment Security Agreement. As of December 31, 2022, the Company has fully repaid the loan under the ¥50M Credit Facility.

As of December 31, 2022 2023 and December 31, 2021, 2022, the Company had \$13.3 \$22.5 million and \$7.4 million \$13.3 million of unused borrowing capacity, respectively.

As of December 31, 2022 2023 and December 31, 2021, 2022, there was \$9.9 \$9.7 million and \$5.4 million \$9.9 million of restricted cash, investments or security deposits associated with the loan facilities, respectively.

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NOTE L—CONVERTIBLE SENIOR NOTES

On March 5, 2019, the Company issued \$80.5 million of 5% convertible senior notes due 2024 (the "Notes" "2024 Notes"). On December 5, 2023, the Company issued approximately \$80.2 million aggregate principal amount of 5.250% convertible senior notes due 2026 (the "2026 Notes"), and on the same day consummated various separate, privately negotiated exchange agreements with certain holders of its 2024 Notes to exchange or repurchase approximately \$80.2 million principal amount of the 2024 Notes for aggregate consideration consisting of approximately \$81.1 million in cash, which included accrued interest on the 2024 Notes, and approximately 466,368 shares of the Company's common stock, par value \$0.001 per share.

The 2026 Notes were issued pursuant to an indenture, Indenture, dated as of March December 5, 2023, (5, 2019 (the "Indenture" the "Indenture"), between the Company and Wells Fargo Bank, National Association, Computershare Trust Company, N.A., as trustee, paying agent, and conversion agent (the "Trustee"). trustee. The 2026 Notes will bear interest at a rate of 5.00% 5.250% per year payable in cash and will pay interest semi-annually in arrears on March June 15 15 and September December 15 15 of each year, beginning on September June 15, 2024. The 15, 2026 2019. The Notes will mature on March December 15, 2026, 15, 2024, unless earlier repurchased, converted, redeemed or converted repurchased in accordance with their terms.

The sale of the Notes generated net proceeds of \$76.4 million, after deducting the Initial Purchasers' discounts and offering expenses payable by the Company. The Company used approximately \$37.8 million of the net proceeds from the offering to fully repay the CapEx Loan and Term Loan with BB&T and the remainder will be used for general corporate purposes.

The following table presents the carrying value of the 2026 Notes for the periods indicated (in thousands):

	December 31, 2022	December 31, 2023
Principal	\$ 80,500	\$ 80,214
Unamortized debt issuance costs	(994)	(3,981)
Net carrying amount	\$ 79,506	\$ 76,233

The Notes are convertible at the option of holders of the Notes at any time until the close of business on the scheduled trading day immediately preceding the maturity date. Upon conversion, holders of the Notes will receive shares of the Company's common stock, together, if applicable, with cash in lieu of any fractional share, at the then-applicable conversion rate. The initial conversion rate for the 2026 Notes is 56.9801 65.6276 shares of the Company's common stock per \$1,000 principal amount of the 2026 Notes (representing an initial (which is equivalent to a conversion price of approximately \$17.55 per share of common stock, which represents an initial conversion premium of approximately 30% above the closing price of \$13.50 \$15.24 per share of the Company's common stock, representing a premium of approximately 15% over the last reported sale

price of the Company's common stock on February 28, 2019 of \$13.25 per share), subject to customary adjustments. If a make-whole fundamental change (as defined in the Indenture) occurs, 2026 Notes will have the right to convert their 2026 Notes only upon the occurrence of certain events. From and in connection with certain other conversions after September 15, 2026, holders of the 2026 Notes may convert their 2026 Notes at any time at their election until the close of business on the second scheduled trading day immediately before March 15, 2022, the maturity date. The Company will in certain circumstances increase settlement conversions by paying or delivering, as applicable, cash, shares of its common stock or a combination of cash and shares of its common stock, at the Company's election, based on the applicable conversion rate for a specified period of time.

Initially and as of December 31, 2022, there are no guarantors of the 2026 Notes, but the 2026 Notes will be fully and unconditionally guaranteed, on a senior, unsecured basis by certain of the Company's future domestic subsidiaries. The 2026 Notes are the Company's senior, unsecured obligations and are equal in right of payment with existing and future senior, unsecured indebtedness, senior in right of payment to the Company's existing and future indebtedness that is expressly subordinated to the 2026 Notes and effectively subordinated to the Company's existing and future secured indebtedness, to the extent of the value of the collateral securing that indebtedness. The Note Guarantee (as defined in the Indenture) of each future guarantor, if any, will be such guarantor's senior, unsecured obligations and are equal in right of payment with existing and future senior, unsecured indebtedness, senior in right of payment to such future guarantor's existing and future indebtedness that is expressly subordinated to the 2026 Notes and effectively subordinated to such future guarantor's existing and future secured indebtedness, to the extent of the value of the collateral securing that indebtedness.

Holders may require

The Indenture contains covenants that limit the Company's ability and the ability of our subsidiaries to, repurchase their among other things: (i) incur or guarantee additional indebtedness or issue disqualified stock; and (ii) create or incur liens.

The 2026 Notes upon the occurrence of a fundamental change (as defined) will be redeemable, in whole or in part (subject to certain limitations described in the Indenture), at the Company's option at any time, and from time to time, on or after December 15, 2024 and on or before the 40th scheduled trading day immediately before the maturity date, at a cash purchase redemption price equal to the principal amount thereof of the 2026 Notes to be redeemed, plus accrued and unpaid interest, if any.

After March 15, 2022, any, to, but excluding, the Company may redeem for cash all or part of the Notes redemption date, but only if the last reported sale price per share of the Company's common stock exceeds 130% of the conversion price on (i) (1) each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the trading day immediately before the date the Company sends the related redemption notice; and (ii) (2) the trading day immediately before the date the Company sends such redemption notice. The

In addition, the 2026 Notes will be redeemable, in whole or in part, at the Company's option at any time, and from time to time, on or before the 40th scheduled trading day immediately before the maturity date, at a cash redemption price is equal to 100% of the principal amount of the notes 2026 Notes to be redeemed, plus accrued and unpaid interest, if any, to, but excluding, the redemption date. In addition, calling date (subject to the right of a holder of 2026 Notes as of the close of business on a record date to receive the related interest payment on the corresponding interest payment date), if the Company completes the "Specified Divestiture" of (x) one or more of its manufacturing facilities located in the People's Republic of China and/or (y) significant assets located in the People's Republic of China which relate to the Company's transceiver business and multi-channel optical sub-assembly products (or any substantially related assets), for aggregate consideration in cash to the Company of not less than the U.S. Dollar equivalent of \$150,000,000 (measured at the time of completion).

Calling any Convertible Note for redemption will constitute a "make-whole fundamental change" (as defined in the Indenture) with respect to that Convertible Note, in which case the conversion rate applicable to the conversion of that Convertible Note will be increased in certain circumstances if it is converted after it is called for redemption.

In addition, if the Specified Divestiture is completed, then each holder of 2026 Notes will have the right to require the Company to repurchase its 2026 Notes for cash on a date of the Company's choosing, which must be a business day that is no more than 35, nor less than 20, business days after we send the related notice of Specified Divestiture. The repurchase price for a note tendered for such repurchase will be equal to the principal amount of the 2026 Notes to be repurchased, plus accrued and unpaid interest, if any, to, but excluding, the repurchase date (subject to the right of a holder of 2026 Notes as of the close of business on a record date to receive the related interest payment on the corresponding interest payment date).

Moreover, if the Company undergoes a fundamental change, as described in the Indenture, holders of the 2026 Notes may require the Company to repurchase for cash all or part of their 2026 Notes at a repurchase price equal to 100% of the principal amount of the 2026 Notes to be repurchased, plus accrued and unpaid interest to, but excluding, the required repurchase date.

The Indenture contains covenants that limit the Company's ability and 2026 Notes are subject to customary events of default. No sinking fund is provided for the ability of our subsidiaries to, among other things: (i) incur or guarantee additional indebtedness or issue disqualified stock; and (ii) create or incur liens. 2026 Notes.

Pursuant to the guidance in ASC 815-40, Contracts in Entity's Own Equity, the Company evaluated whether the conversion feature of the note needed to be bifurcated from the host instrument as a freestanding financial instrument. Under ASC 815-40, to qualify for equity classification (or non-bifurcation, if embedded) the instrument (or embedded feature) must be both (1) indexed to the issuer's own stock and (2) meet the requirements of the equity classification guidance. Based upon the Company's analysis, it was determined the conversion option is indexed to its own stock and also met all the criteria for equity classification contained in ASC 815-40-25-7 and 815-40-25-10. Accordingly, the conversion option is not required to be bifurcated from the host instrument as a freestanding financial instrument. Since the conversion feature meets the equity scope exception from derivative accounting, the Company then evaluated whether the conversion feature needed to be separately accounted for as an equity component under ASC 470-20, Debt with Conversion and Other Options. The Company determined that notes should be accounted for in their entirety as a liability.

The following table sets forth interest expense information related to the 2024 Notes (in thousands):

	Year ended December 31,		Year ended December 31,	
	2022	2021	2023	2022
Contractual interest expense	\$ 4,025	\$ 4,025	\$ 4,039	\$ 4,025
Amortization of debt issuance costs	826	826	849	826
Total interest cost	\$ 4,851	\$ 4,851	\$ 4,888	\$ 4,851
Effective interest rate	5.1 %	5.1 %	5.1 %	5.1 %

NOTE M—ACCRUED LIABILITIES

Accrued liabilities consisted of the following for the periods indicated (in thousands):

	December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022
Accrued payroll	\$ 9,702	\$ 6,516	\$ 12,146	\$ 9,702
Accrued employee benefits	3,265	3,471	3,376	3,265
Accrued state and local taxes	588	1,897	745	588
Accrued interest	1,597	1,475	341	1,597
Accrued shipping and tariff expenses	—	33	27	—
Advance payments	3,216	195	187	216
Accrued commission	937	1,003	649	937
Accrued professional fees	409	346	270	409
Accrued product warranty	140	263	255	140
Accrued other	368	388	553	368
Total accrued liabilities	\$ 20,222	\$ 15,587	\$ 18,549	\$ 17,222

NOTE N—OTHER INCOME AND EXPENSE

Other income and expense consisted of the following for the periods indicated (in thousands):

	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2023	2022	2021
Foreign exchange transaction gain (loss)	\$ (1,488)	\$ 454	\$ 1	\$ 711	\$ (1,488)	\$ 454
Government subsidy income	160	1,345	2,708	937	160	1,345
Other non-operating gain	76	129	304			
Other non-operating gain(loss)				(7,468)	76	129
Loan forgiveness	—	6,229	—	—	—	6,229
Gain (loss) on disposal of assets	47	(1)	(15)	(51)	47	(1)
Total other gain (loss), net	\$ (1,205)	\$ 8,156	\$ 2,998	\$ (5,871)	\$ (1,205)	\$ 8,156

NOTE O—INCOME TAXES

The sources of the Company's loss from operations before income taxes were as follows (in thousands):

	Years ended December 31,			Years ended December 31,		
	2022	2021	2020	2023	2022	2021
Domestic	\$ (45,404)	\$ (21,229)	(20,288)	\$ (52,886)	\$ (45,404)	\$ (21,229)
Foreign	(20,992)	(32,931)	(30,936)	(3,153)	(20,992)	(32,931)

Total loss before income taxes	\$ (66,396)	\$ (54,160)	(51,224)	\$ (56,039)	\$ (66,396)	\$ (54,160)
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The provision for income tax expense (benefit) for the years ended December 31, was as follows (in thousands):

	2022	2021	2020	2023	2022	2021
Current:						
Federal	\$ —	\$ —	\$ 41	\$ —	\$ —	\$ —
State	1	2	2	1	1	2
Foreign	—	—	—	8	—	—
Total	\$ 1	\$ 2	\$ 43	\$ 9	\$ 1	\$ 2
Deferred:						
Federal	\$ —	\$ —	\$ (172)	\$ —	\$ —	\$ —
State	—	—	—	—	—	—
Foreign	—	—	7,357	—	—	—
Total	\$ —	\$ —	\$ 7,185	\$ —	\$ —	\$ —
Income tax (benefit) expense	\$ 1	\$ 2	\$ 7,228	\$ 9	\$ 1	\$ 2

Deferred income tax assets and liabilities result principally from net operating losses, different methods of recognizing depreciation, reserves for doubtful accounts and inventory, research and development credits and foreign tax credits. At December 31, the net deferred tax assets and liabilities are comprised of the following approximate amounts (in thousands):

	2022	2021
NOL carryforward	\$ 47,901	\$ —
Inventory reserves	2,892	—
Unrealized gains and losses	363	—
Share-based compensation	914	—
Foreign tax credit	4,599	—
Research and development credits	10,505	—
Interest	3,966	—
ASC 842 Assets	1,602	—
Other	776	—
Deferred tax assets	73,518	—
Less valuation allowance	(69,680)	—
Deferred tax assets, net	3,838	—
Depreciation and amortization	(2,441)	—
ASC 842 Liabilities	(1,397)	—
Deferred tax liabilities	(3,838)	—
Deferred tax assets, net	\$ —	\$ —
	2023	2022
NOL carryforward	\$ 49,469	\$ —
Inventory reserves	3,195	—
Unrealized gains and losses	355	—
Share-based compensation	1,013	—
Foreign tax credit	4,599	—
Research and development credits	10,998	—
Capitalized research and development	8,717	—
Interest	5,659	—
ASC 842 Assets	1,561	—

Other	941	
Deferred tax assets	86,507	
Less valuation allowance	(78,124)	
Deferred tax assets, net	8,383	
Depreciation and amortization	(6,992)	
ASC 842 Liabilities	(1,391)	
Deferred tax liabilities	(8,383)	
Deferred tax assets, net	\$ —	\$ —

The Company has a U.S. net operating loss carry forward of approximately \$111.5 million, \$112 million, \$32.7 million of which, if unused, expires between 2026 and 2032 and \$78.8 million \$79.3 million of which, can be carried forward indefinitely. The Company has U.S. and state research and development tax credits of \$10.5 million, \$11 million, which, if unused, expire between 2028 and 2042, 2043. In addition, the Company has foreign tax credits of \$4.6 million, which, if unused, will expire in 2028. Utilization of U.S. net operating losses and tax credit carry forwards are subject to an annual limitation due to the ownership change limitations set forth in Internal Revenue Code Section 382. As of December 31, 2022, 2023, the Company had Taiwan net operating loss carry forwards of approximately \$72.5 million \$73.7 million and China net operating loss carry forwards of approximately \$58.8 million, \$66.9 million. The carryforward period for the Taiwan net operating loss carry forwards is ten years, and the expiration period begins 2028. The carryforward period for China net operating loss carry forwards is ten years, and the expiration period begins 2029.

Management assesses the available positive and negative evidence to estimate whether sufficient future taxable income will be generated to permit use of the existing deferred tax assets. A significant piece of objective negative evidence evaluated was the cumulative loss incurred over the three-year period ended December 31, 2022, 2023. Such objective evidence limits the ability to consider other subjective evidence, such as our projections for future growth.

On the basis of this evaluation, as of December 31, 2022, 2023 and December 31, 2021, 2022, a valuation allowance of \$69.7 million \$78.1 million and \$57.7 million, \$69.7 million, respectively, has been recorded to recognize only the portion of the deferred tax asset that is more likely than not to be realized. The amount of the deferred tax asset considered realizable, however, could be adjusted if estimates of future taxable income during the carryforward period are reduced or increased or if objective negative evidence in the form of cumulative losses is no longer present and additional weight is given to subjective evidence such as our projections for growth.

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The following table shows the change in the deferred tax valuation allowance as follows:

	2022	2021	2020	2023	2022	2021
Beginning Balance, January 1	\$ 57,721	\$ 43,462	\$ 25,736	\$ 69,680	\$ 57,721	\$ 43,462
Change charged to expense/(income)	14,196	13,822	17,137	8,755	14,196	13,822
Change charged to currency translation adjustment	(2,237)	437	589	(311)	(2,237)	437
Ending Balance, December 31	\$ 69,680	\$ 57,721	\$ 43,462	\$ 78,124	\$ 69,680	\$ 57,721

A reconciliation of the U.S. federal income tax rate of 21% for the years ended December 31, 2022, 2023, 2021, 2022 and 2020, 2021, respectively, to the Company's effective income tax rate follows (in thousands):

	2022	2021	2020	2023	2022	2021
Expected taxes at statutory rate	\$ (13,943)	\$ (11,374)	\$ (10,775)	\$ (11,768)	\$ (13,943)	\$ (11,374)
PPP loan forgiveness	—	(1,308)	—	—	—	(1,308)
Non-deductible/non-taxable items	33	897	1,132	57	33	897
Global intangible low-taxed income				2,568		
Foreign rate differences	552	107	1,153	242	552	107
Foreign permanent differences	(1,407)	(1,320)	(1,002)	(1,212)	(1,407)	(1,320)
Changes in valuation allowance	14,196	13,822	17,137	8,755	14,196	13,822
Share-based compensation	879	468	426	729	879	468
Research and development credits	(626)	(872)	(744)	(492)	(626)	(872)
Alternative Minimum Tax	—	—	(172)			
Extinguishment of debt				1,580	—	—
Foreign other	—	—	12	—	—	—
Other, net	317	(418)	61	(450)	317	(418)

Tax (benefit) expense	\$	1	\$	2	\$	7,228	\$	9	\$	1	\$	2
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The Company's provision for income taxes in 2023 was higher than 2022 primarily due to state taxes and foreign taxes.

The Company's provision for income taxes in 2022 was lower than 2021 primarily due to state taxes.

The Company's provision for income taxes in 2021 was lower than 2020 due to the recognition of a valuation allowance on the deferred tax assets, along with excess tax expense from stock-based compensation, partially offset by differences in pre-tax income and recording research and development credits.

The Company's wholly owned subsidiary, Prime World is a tax-exempt entity under the Income Tax Code of the British Virgin Islands.

The Company's wholly owned subsidiary, Global Technology, Inc., has enjoyed preferential tax concessions in China as a national high-tech enterprise. In March 2007, China's parliament enacted the PRC Enterprise Income Tax Law, or the EIT Law, under which, effective January 1, 2008, China adopted a uniform income tax rate of 25% for all enterprises including foreign invested enterprises. However, Global Technology, Inc. has been recognized as a National high-tech enterprise since 2008 and entitled to a 15% reduced tax rate. In December 2020, 2023, Global Technology, Inc. again renewed its National high-tech enterprise certificate and therefore extended its three-year tax preferential status until December 2023, 2026. This tax holiday reduced its 2022, 2023, 2021, 2022 and 2020, 2021 income tax provision by approximately \$0.0 million, \$0.0 million, and \$1.4 million, \$0.0 million, respectively. This tax holiday reduced its fiscal 2022, 2023, 2021, 2022, and 2020, 2021 diluted earnings per share by approximately \$0.00, \$0.00, and \$0.05, \$0.00 respectively. Effective January 1, 2016, China expanded the scope of the National high-tech enterprise to include additional deductions for qualifying research and development.

As of December 31, 2022, 2023, 2021, 2022 and 2020, 2021, the total amount of unrecognized tax benefit was \$0.2 million, \$0.2 million, and \$0.2 million, respectively. The following is a tabular reconciliation of the total amounts of unrecognized tax benefits (in thousands):

	2022	2021	2020	2023	2022	2021
Unrecognized tax benefits — January 1	\$ 181	\$ 181	\$ 181	\$ 181	\$ 181	\$ 181
Gross increases — tax positions in prior period	—	—	—	—	—	—
Gross decreases — tax positions in prior period	—	—	—	—	—	—
Unrecognized tax benefits — December 31	\$ 181	\$ 181	\$ 181	\$ 181	\$ 181	\$ 181

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The Company recognizes interest accrued related to unrecognized tax benefits and penalties as income tax expense. Related to the unrecognized tax benefits noted above, it has not accrued penalties or interest during 2022, 2023 as a result of net operating losses. During 2021, 2022 or 2020, 2021, the Company also accrued no penalties or interest.

The Company is subject to taxation in the United States and various states and foreign jurisdictions. The Company's open tax years subject to examination in the U.S. federal and state jurisdictions are 2019, 2020 through 2021, 2023. To the extent allowed by law, the taxing authorities may have the right to examine prior periods where net operating losses or tax credits were generated and carried forward, and make adjustments up to the amount of the net operating loss or tax credit carryforward. The Company is subject to examination for tax years 2011, 2018 forward for various foreign jurisdictions.

In response to the COVID-19 pandemic, the CARES Act was signed into law on March 27, 2020. The CARES Act, among other things, includes tax provisions relating to refundable payroll tax credits, deferment of employer social security payments, net operating loss utilization and carryback periods, modifications to the net interest deduction limitations and technical corrections to tax depreciation methods for qualified improvement property ("QIP"). On December 27, 2020, the Taxpayer Certainty and Disaster Tax Relief Act of 2020 was enacted as part of the Consolidated Appropriations Act, 2021, followed by the American Rescue Plan Act on March 1, 2021. These laws, among many other provisions, expand and extend the Paycheck Protection Program ("PPP"), refundable employee retention tax credits previously made available under the CARES Act and allow a full deduction for business meals for the 2021 and 2022 tax years. During 2021, the Company recognized a tax benefit of \$1.3 million on the non-taxable forgiveness of the PPP loan. However, the legislation had no material impact to income tax expense on the Company's financial statements as a result of our valuation allowance.

On August 9, 2022, the Creating Helpful Incentives to Produce Semiconductors and Science Act, (the "CHIPS Act") was signed into law. Among other things, the CHIPS Act provides for refundable tax credits and certain other financial incentives to further investments in domestic manufacturing. The There was no material impact of this Act in 2023, and the Company is evaluating has determined that any future impacts will depend on the provisions extent to which the Company expands its semiconductor manufacturing operations in accordance with the requirements of the new law and the potential impacts to the Company. Act.

On August 16, 2022, legislation commonly known as the Inflation Reduction Act was signed into law. Among other things, the Inflation Reduction Act includes a 1% excise tax on corporate stock repurchases, applicable to repurchases after December 31, 2022, and also a new minimum tax based on book income. We are in the process of evaluating the potential impacts of the Inflation Reduction Act to us. While we do not currently expect the Inflation Reduction Act to have a material impact on our effective tax rate, our analysis of the effect of the Inflation Reduction Act on us is ongoing and incomplete, and it is possible that the Inflation Reduction Act (or implementing regulations and other guidance, which have not yet been issued) could adversely impact our current and deferred federal tax liability. rate.

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Equity Plans

The Company's board of directors and stockholders approved the following equity plans:

- The Company issued stock options, restricted stock awards ("RSAs") and restricted stock units ("RSUs") to employees, consultants and non-employee directors. Stock option awards generally vest over a four year period and have a maximum term of ten years. Stock options under these plans have been granted with an exercise price equal to the fair market value on the date of the grant. Nonqualified and Incentive Stock Options, RSAs and RSUs may be granted from these plans. Prior to the Company's initial public offering in September 2013, the fair market value of the Company's stock had been historically determined by the board of directors and from time to time with the assistance of third party valuation specialists.

Stock Options

Options have been granted to the Company's employees under the **two 2013 incentive plans Plan** and generally become exercisable as to 25% of the shares on the first anniversary date following the date of grant and 12.5% on a semi-annual basis thereafter. All options expire ten years after the date of grant.

The following is a summary of option activity (in thousands, except per share data):

	2022							2023						
	Number of shares	Weighted Average	Share Price	Weighted Average	Remaining	Aggregate	Number of shares	Weighted Average	Share Price	Weighted Average	Remaining	Aggregate		
		Average	on Date of	Average	Contractual	Intrinsic		Average	on Date of	Average	Contractual	Intrinsic		
		Exercise	Exercise	Fair Value	Life	Value		Exercise	Exercise	Fair Value	Life	Value		
		Price						Price						
(in thousands, except price data)							(in thousands, except price data)							
Outstanding, January 1, 2022	1,270	\$ 10.32		\$ 5.44	1.69	\$ —	263	\$ 10.41		\$ 5.45	0.71	\$ —		
Outstanding, January 1, 2023	1,270	\$ 10.32		\$ 5.44	1.69	\$ —	263	\$ 10.41		\$ 5.45	0.71	\$ —		
Exercised	—	—	—	—	—	—	(48)	11.33	16.23	5.81	0.03	237		
Forfeited	(6)	6.54		5.03		—	(214)	10.18		5.36		1,955		
Outstanding, December 31, 2022	264	10.41		5.45	0.71	—	263	10.41		5.45	0.71	—		

Exercisable, December 31, 2022	264	10.41	5.45	0.71	—					
Outstanding, December 31, 2023						1	13.84	7.12	0.08	8
Exercisable, December 31, 2023						1	13.84	7.12	0.08	8
Vested and expected to vest	264	10.41	5.45	0.71	—	1	13.84	7.12	0.08	8

As of December 31, 2022 2023, there was no unrecognized stock option expense.

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Performance Based Incentive Plan/PlanRestricted Stock Unit

The Company approved to grant restricted performance stock units ("PSUs") to senior executives as a part of our long-term equity compensation program starting from June 2021. The number of shares of common stock that will ultimately be issued to settle PSUs granted ranges from 0% to 200% of the number granted and is determined based on certain performance criteria over a three-year measurement period. The performance criteria for the PSUs are based on a combination of the performance of our stock price and the Total Shareholder Return ("TSR") for the performance period compared with the TSR of certain peer companies or index for the performance period. PSUs granted vest 100% on the third anniversary of their grant, assuming achievement of the applicable performance criteria. We estimated the fair value of the PSUs using a Monte Carlo simulation model on the date of grant. Compensation expense is recognized ratably over the explicit service period. The Company recognized PSU expenses expense for the twelve months ended December 31, 2022 2023 and 2021 2022 was \$3 million and \$1.7 million, and \$0.7 million, respectively. The following is a summary of PSU activity (in thousands, except per share data):

	Number of shares	Weighted Average Share Price on Date of Release (in thousands, except price data)	Weighted Average Fair Value	Aggregate Intrinsic Value
Outstanding at January 1, 2023	766		\$ 6.75	\$ 1,447
Granted	767		8.89	3,566
Released	—		—	—
Cancelled/Forfeited	—		—	—
Outstanding, December 31, 2023	1,533		7.82	29,610
Vested and expected to vest	1,533		7.82	29,610

As of December 31, 2023, there was \$6.6 million of unrecognized compensation expense related to these PSUs. This expense is expected to be recognized over 2.1 years.

Restricted Stock Units

Restricted stock units are issued to employees through a vesting plan and distribution schedule after employee remains with the Company for a particular length of time. The following is a total summary of PSU/RSU activity (in thousands, except per share data):

	Weighted Average Share Price on Date of Release (in thousands, except price data)	Weighted Average Fair Value (in thousands, except price data)	Aggregate Intrinsic Value (in thousands, except price data)		Weighted Average Share Price on Date of Release (in thousands, except price data)	Weighted Average Fair Value (in thousands, except price data)	Aggregate Intrinsic Value (in thousands, except price data)
Number of shares	Price on Date of Release	Average Fair Value	Intrinsic Value	Number of shares	Price on Date of Release	Average Fair Value	Intrinsic Value

Outstanding at January 1, 2022	2,170	\$	11.15	\$	11,156				
Outstanding at January 1, 2023						2,209	\$	5.76	\$ 4,176
Granted	1,977		2.04		3,687	2,200		4.76	10,449
Released	(1,023)	\$	2.75		2,818	(1,397)	\$	5.61	7,833
Cancelled/Forfeited	(149)		10.02		281	(139)		3.91	2,692
Outstanding, December 31, 2022	2,975		6.01		5,623				
Outstanding, December 31, 2023						2,873		4.89	55,507
Vested and expected to vest	2,975		6.01		5,623	2,873		4.89	55,507

As of December 31, 2022, there was \$13.8 million of unrecognized compensation expense related to these RSUs. This expense is expected to be recognized over 1.95 years.

Share-Based Compensation

The Company recognizes compensation expense on a straight-line basis over the applicable vesting term of the award and expense is adjusted as forfeitures occur.

In 2014, the Company ceased issuing stock options and began issuing RSUs and RSAs as share-based compensation to employees. The Company estimates the fair value of RSUs and RSAs at the fair market value on the grant date.

Employee share-based compensation expenses recognized for the years ended December 31, were as follows (in thousands):

Share-Based compensation - by expense type:

	2022	2021	2020
Cost of goods sold	\$ 488	\$ 885	\$ 937
Research and development	1,332	2,173	2,812
Sales and marketing	857	1,115	1,191
General and administrative	6,923	7,948	8,106
Total share-based compensation expense	\$ 9,600	\$ 12,121	\$ 13,046
	2023	2022	2021
Cost of goods sold	\$ 524	\$ 488	\$ 885
Research and development	1,492	1,332	2,173
Sales and marketing	1,110	857	1,115
General and administrative	8,758	6,923	7,948
Total share-based compensation expense	\$ 11,884	\$ 9,600	\$ 12,121

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NOTE Q—STOCKHOLDERS' EQUITY

Common Stock

The Company's Amended and Restated Certificate of Incorporation authorizes the issuance of up to 45,000,000 80,000,000 shares of common stock, all of which have been designated voting common stock.

Preferred Stock

The Company's Amended and Restated Certificate of Incorporation authorizes the issuance of up to 5,000,000 shares of preferred stock.

Public Offerings of Common Stock

On **October 24, 2019, January 5, 2023**, **we the Company** filed a Registration Statement on Form S-3 with the Securities and Exchange Commission, which was declared effective on **January 9, 2020, March 21, 2023**, providing for the public offer and sale of certain securities of the Company from time to time, at our discretion, up to an aggregate amount of \$185 million. Pursuant to Rule **\$250 415(a)(6)** under the Securities Act, the securities registered pursuant to this registration statement include **unsold securities** previously registered for sale pursuant to our previously filed Registration Statement on Form S- 3, **million**, **which became effective on January 9, 2020.**

On **February 28, 2020, March 24, 2023**, we entered into an Equity Distribution Agreement (**the "Agreement"**) with Raymond James & Associates **Inc.** (the "**Sales Agent**" "**Sales Agent**") pursuant to which the Company may issue and sell shares of the Company's common stock having an aggregate offering price of up to \$55 million (the "**Initial ATM Offering**"), from time to time through the Sales Agent. In January 2021, the Company completed its Initial ATM Offering and sold 5.9 million shares at a weighted average price of \$9.12 per share, providing proceeds of \$53.9 million, net of expenses and underwriting discounts and commissions.

On February 26, 2021, we entered into another Equity Distribution Agreement (the "Agreement") with the Sales Agent pursuant to which the Company may issue and sell shares of the Company's common stock, par value \$0.001 per share (the "**Shares**" "**Shares**") having an aggregate offering price of up to \$35 million (the "**Second ATM Offering**" "**ATM Offering**"), from time to time through the Sales Agent. Upon delivery of a placement notice and subject to the terms and conditions of the Agreement, sales, if any, of the Shares will be made through the Sales Agent in transactions that are deemed to be "at the market" offerings as defined in Rule 415 of the Securities Act of 1933, as amended (the "**Securities Act**" "**Securities Act**"), including sales made through the facilities of the Nasdaq Global Market, the principal trading market for the Company's common stock, on any other existing trading market for the Company's common stock, to or through a market maker or as otherwise agreed by the Company and the Sales Agent. In the placement notice, the Company will designate the maximum number of Shares to be sold through the Sales Agent, the time period during which sales are requested to be made, the minimum price for the Shares to be sold, and any limitation on the number of Shares that may be sold in any one day. Subject to the terms and conditions of the Agreement, the Sales Agent will use its commercially reasonable efforts to sell Shares on the Company's behalf up to the designated amount specified in the placement notice. The Company has no obligation to sell any Shares under the Agreement and may at any time suspend offers and sales of the Shares under the Agreement.

The Agreement provides that the Sales Agent will be entitled to compensation of up to 2% of the gross sales price of the Shares sold through the Sales Agent from time to time. The Company has also agreed to reimburse the Sales Agent for certain specified expenses in connection with the registration of Shares under state blue sky laws and any filing with, and clearance of the offering by, the Financial Industry Regulatory Authority Inc., not to exceed \$10,000 in the aggregate, and any associated application fees incurred. Additionally, if the Agreement is terminated under certain circumstances, and the Company fails to sell a minimum amount of the Shares as set forth in the Agreement, then the Company has agreed to reimburse the Sales Agent for reasonable out-of-pocket expenses, including the reasonable fees and disbursements of counsel incurred by the Sales Agent, up to a maximum of \$30,000 in the aggregate. The Company agreed to indemnify the Sales Agent against certain liabilities, including liabilities under the Securities Act, or to contribute to payments that the Sales Agent may be required to make because of any of those liabilities.

On **September 12, 2023**, we entered into Amendment No.1 to the Agreement with the Sales Agent, to increase the aggregate offering price from \$35 million to \$70 million. In **March 2021, November, 2023**, we **commenced completed** sales **of common stock through under** the **Second** ATM Offering.

The details of the shares of common stock sold through the **Second** ATM Offering **through December 31, 2023** are as follows (in thousands, except shares and weighted average per share price):

Distribution Agent			Month	Weighted Average Per Share Price	Number of Shares Sold	Net Proceeds	Compensation to Distribution Agent	Month	Weighted Average Per Share Price	Number of Shares Sold	Net Proceeds	Compensation to Distribution Agent
Raymond	James	&	March 2021	9.0622	65,748	\$ 584	12	Feb 2023	\$ 2.811	158	\$ 436	\$ 9
Raymond	James	&	June 2021	9.1115	34,686	310	6	Jun 2023	4.036	2,497	9,879	202
Raymond	James	&	July 2021	9.1061	6,740	60	1	Aug 2023	11.645	1,150	13,124	268
Raymond	James	&	September 2022	2.9045	94,491	269	5	Sept 2023	10.184	892	8,901	182
Raymond	James	&	October 2022	2.8947	313,333	889	18	Oct 2023	11.003	1,043	11,244	229
Raymond	James	&	November 2022	2.7830	29,426	80	2	Nov 2023	12.572	2,068	25,473	520
Total			Total		544,424	\$ 2,192	44	Total		7,808	\$ 69,057	\$ 1,410

NOTE R—SEGMENT AND GEOGRAPHIC INFORMATION

The Company operates in one reportable segment. The Company's Chief Executive Officer, who is considered to be the chief operating decision maker, manages the Company's operations as a whole and reviews financial information presented on a consolidated basis, accompanied by information about product revenue, for purposes of evaluating financial performance and allocating resources.

The following tables set forth the Company's revenue and asset information by geographic region. Revenue is classified based on the location of where the product is manufactured. Long-lived assets in the tables below comprise only property, plant, equipment and intangible assets (in thousands):

	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2023	2022	2021
Revenues:						
United States	\$ 7,423	\$ 14,633	\$ 18,380	\$ 30,798	\$ 7,423	\$ 14,633
Taiwan	164,144	99,201	131,076	143,528	164,144	99,201
China	51,251	97,731	85,167	43,320	51,251	97,731
	<u>\$ 222,818</u>	<u>\$ 211,565</u>	<u>\$ 234,623</u>	<u>\$ 217,646</u>	<u>\$ 222,818</u>	<u>\$ 211,565</u>

	As of December 31,			As of December 31,		
	2022	2021	2020	2023	2022	2021
Long-lived assets:						
United States	\$ 80,048	\$ 87,709	\$ 90,999	\$ 75,283	\$ 80,048	\$ 87,709
Taiwan	50,777	63,644	71,080	47,668	50,777	63,644
China	93,888	108,509	108,575	91,050	93,888	108,509
	<u>\$ 224,713</u>	<u>\$ 259,862</u>	<u>\$ 270,654</u>	<u>\$ 214,001</u>	<u>\$ 224,713</u>	<u>\$ 259,862</u>

The Company serves four primary markets, CATV, the internet data center, CATV, telecom and FTTH markets. Of the Company's total revenues in 2023, the Company earned \$141.2 million, or 64.9%, from the internet data center market, \$59.9 million, or 27.5%, from the CATV market, \$13.8 million, or 6.4%, from the telecom market and \$0.1 million, or 0.0%, from the FTTH market. Of the Company's total revenues in 2022, the Company earned \$118.2 million, or 53.0%, from the CATV market, \$77.1 million, or 34.6%, from the internet data center market, \$24.7 million, or 11.1%, from the telecom market and \$0.1 million, or 0.1%, from the FTTH market. Of the Company's total revenues in 2021, the Company earned \$94.3 million, or 44.6%, from the CATV market, \$97.5 million, or 46.1%, from the internet data center market, \$16.2 million, or 7.7%, from the telecom market and \$1.0 million, or 0.5%, from the FTTH market. Of the Company's total revenues in 2020, the Company earned \$37.9 million, or 16.2%, from the CATV market, \$173.4 million, or 73.9%, from the internet data center market, \$21.1 million, or 9.0%, from the telecom market and \$0.1 million, or 0.0%, from the FTTH market. Other markets.

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NOTE S—EMPLOYEE BENEFIT PLANS

Employees of Global participate in a state-mandated social security program in China. Under this program, pension costs are recorded on the basis of required monthly contributions to employees' individual accounts during their service periods. Under the regulations of the People's Republic of China, Global is required to make fixed contributions to a fund, which is under the administration of the local labor departments. Pension expense for Global was \$1.0 million, \$1.7 million, \$1.0 million, and \$1.2 million for the years ended December 31, 2022, 2023, 2021 2022 and 2020 2021, respectively.

Employees of Prime World's Taiwan branch participate in a pension program under the Taiwan Labor Pension Act. Pension expense for the Prime World's Taiwan branch was \$0.5 million, \$0.7 million, and \$0.8 million for the years ended December 31, 2022, 2023, 2021 2022 and 2020 2021, respectively.

NOTE T—COMMITMENTS AND CONTINGENCIES

Employment Agreements and Consultancy Agreements

The Company has entered into employment and indemnification agreements with three executive officers. These agreements provide our CEO. The agreement provides that if their his employment is terminated as a result of a change of control of the Company, or if their his employment is terminated for certain other reasons set forth in the

agreements, the Company will be required to pay a severance payment in an amount equal to **their** his annual base salary, and other additional compensation due under the terms of the agreements.

The Company has also entered into employment and indemnification agreements with **one** four other **named** executive **officer**. **This agreement provides officers**. **These agreements provide** that if **his** their employment is terminated as a result of a change of control of the Company, the Company will be required to pay a severance payment in an amount equal to **six months of his** their annual base salary and other additional compensation due under the terms of the agreements.

Contingencies

From time to time, the Company may be subject to legal proceedings and litigation arising in the ordinary course of business, including, but not limited to, inquiries, investigations, audits and other regulatory proceedings, such as described below. The Company records a loss provision when it believes it is both probable that a liability has been incurred and the amount can be reasonably estimated. Unless otherwise disclosed, the Company is unable to estimate the possible loss or range of loss for the legal proceeding described below.

Arbitration filed by Yuhan Optoelectronic Technology (Shanghai) Co., Ltd.

On September 12, 2023, the Company delivered notice of termination with respect to that certain Agreement for the Sale and Purchase of a New Company to be Established in Hong Kong Special Administrative Region of the People's Republic of China (the "Purchase Agreement"), dated September 15, 2022, with Prime World International Holdings Ltd. (the "Seller") and Yuhan Optoelectronic Technology (Shanghai) Co., Ltd. (the "Purchaser"), pursuant to which the Seller would divest its manufacturing facilities located in the People's Republic of China and certain assets related to its transceiver business and multichannel optical sub-assembly products for the internet data center, FTTH and telecom markets. The termination, in accordance with the terms of the Purchase Agreement, was a result of the Purchaser's failure to satisfy certain of its material obligations under the Purchase Agreement. In terminating the Purchase Agreement, we also asserted the right to recover a break-up fee from the Purchaser. On December 22, 2023, the Purchaser filed for arbitration in Hong Kong with the Hong Kong International Arbitration Centre ("HKIAC") challenging the validity of our termination notice and seeking specific performance with respect to the transactions contemplated in the Purchase Agreement, which in any case remain subject to regulatory approvals. On January 22, 2024, the Company **believes** **that there are** filed its response, generally denying the Purchaser's allegations and asserting counterclaims for recovery of a break-up fee. While the Company does **no** not believe the Purchaser's claims have merit and intends to vigorously defend this matter, it is not able to determine the outcome of this dispute **or actions pending** the likelihood **or threatened against it,** amount of the **ultimate disposition of which** Company's loss or recovery, if any, arising from this matter. If specific performance is granted by HKIAC, the transaction contemplated by the Purchase Agreement would **still have a material adverse effect** to be approved by the Committee on **it**. Foreign Investment in the United States prior to its consummation. A hearing date for the arbitration has not been set.

Other Contingencies

On August 9, 2021, **None**.the Company has received a Taxes Notification of Audit Result ("Notice") from the Texas Comptroller's Office (the "Comptroller"), for fiscal years between 2016 and 2019, informing the Company that the Comptroller believes the Company did not qualify for certain sales and use tax exemptions on various Research and Development purchases and accordingly the Company is liable for Sale and Use Tax in the amount of approximately \$1.0 million including interest charges. **The Company paid \$0.4 million for the tax notice, but challenged the remaining tax assessments and vigorously defended its position. The Comptroller's office exhausted its redetermination period and therefore moved AOI's case to hearing process. AOI has not received its hearing schedule. The management estimated that the additional tax assessment will be in the range of \$0.2 million to \$0.4 million including interest charges**

NOTE U—SUBSEQUENT EVENTS

The Company has evaluated subsequent events through the date the financial statements were issued.

In February 2023, the Company repaid its revolving bank line of credit of \$8.3 million.

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Exhibit 4.7

DESCRIPTION OF THE COMPANY'S COMMON STOCK REGISTERED UNDER SECTION 12 OF THE EXCHANGE ACT OF 1934

The following description of the Company's Common Stock is based upon the Company's Amended and Restated Certificate of Incorporation ("Restated Certificate of Incorporation"), the Company's Amended and Restated Bylaws ("Bylaws") and applicable provisions of law. We have summarized certain portions of the Restated Certificate of Incorporation and Bylaws below. The summary is not complete and is subject to, and is qualified in its entirety by express reference to, the provisions of our Restated Certificate of Incorporation and Bylaws, each of which is filed as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.7 is a part.

Authorized Capital Shares

Our authorized capital shares consist of 80,000,000 shares of Common Stock, \$0.001 par value per share ("Common Stock"), and 5,000,000 shares of preferred stock, \$0.001 par value per share ("Preferred Stock"). The outstanding shares of our Common Stock are fully paid and nonassessable. No shares of Preferred Stock have been issued or outstanding.

Voting Rights

Holders of our common stock are entitled to one vote for each share of Common Stock held of record for the election of directors and on all matters submitted to a vote of stockholders.

Dividend Rights

Holders of our Common Stock are also entitled to receive dividends ratably, if any, as may be declared by our board of directors out of legally available funds, subject to any preferential dividend rights of any Preferred Stock then outstanding.

Liquidation Rights

Upon our dissolution, liquidation or winding up, holders of our Common Stock are entitled to share ratably in our net assets legally available after the payment of all our debts and other liabilities, subject to the preferential rights of any Preferred Stock then outstanding.

Other Rights and Preferences

Holders of our Common Stock have no subscription, preemptive, redemption or conversion rights. The rights, preferences and privileges of holders of Common Stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of Preferred Stock that we may designate and issue in the future.

Listing

The Common Stock is traded on The Nasdaq Global Market under the trading symbol "AAOI."

Provisions of Our Restated Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law

Our Restated Certificate of Incorporation and Bylaws include a number of provisions that may have the effect of encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board composition and filling vacancies

In accordance with our Restated Certificate of Incorporation, our board of directors is divided into three classes serving staggered three-year terms, with one class being elected each year. Our Restated certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of 66 2/3% or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board of directors, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No written consent of stockholders

Our Restated Certificate of Incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Meetings of stockholders

Our Bylaws provide that only a majority of the members of our board of directors then in office, the Chairman of the board of directors or the Chief Executive Officer may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our Bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance notice requirements

Our Bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary before the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days or more than 120 days before the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in our Bylaws.

Amendment to bylaws and certificate of incorporation

As required by the Delaware General Corporation Law (the "DGCL"), any amendment of our Restated Certificate of Incorporation must first be approved by a majority of our board of directors and, if required by law or our Restated Certificate of Incorporation, thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, directors, limitation of liability and the amendment of our Bylaws and Restated Certificate of Incorporation must be approved by not less than 66 2/3% of the outstanding shares entitled to vote on the amendment, and not less than 66 2/3% of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority vote of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least 66 2/3% of the outstanding shares entitled to vote on the amendment, or, if the board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Blank check preferred stock

Our Restated Certificate of Incorporation authorizes 5,000,000 shares of Preferred Stock. The existence of authorized but unissued shares of Preferred Stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of Preferred Stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our Restated Certificate of Incorporation grants our board of directors' broad power to establish the rights and preferences of authorized and unissued shares of Preferred Stock. The issuance of shares of Preferred Stock could decrease the amount of earnings and assets available for distribution to holders of shares of Common Stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

Choice of Forum

Our Restated Certificate of Incorporation provides that, unless the Company consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or the Company's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the DGCL or the Company's Restated Certificate of Incorporation or Bylaws, or (iv) any action asserting a claim against the Company governed by the internal affairs doctrine. The forum selection provision in our Restated Certificate of Incorporation does not apply to suits arising under the Securities Exchange Act of 1934 but does apply to other state and federal law claims including actions arising under the Securities Act of 1933 (although our stockholders will not be deemed to have waived our compliance with the federal

securities laws and the rules and regulations thereunder). With respect to suits arising under the Securities Act of 1933, the enforceability of forum selection provisions has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against the Company, a court could find the choice of forum provisions contained in the Restated Certificate of Incorporation to be inapplicable or unenforceable in such action.

Anti-takeover effects of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the DGCL, or Section 203. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a 3-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or did own within the three years before the determination of interested stockholder status, 15% or more of the corporation's voting stock. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- 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, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or
- at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 could delay or prohibit mergers or other takeover or change in control attempts with respect to us 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 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our reports dated February 23, 2023 February 23, 2024, with respect to the consolidated financial statements and internal control over financial reporting included in the Annual Report of Applied Optoelectronics, Inc. on Form 10-K for the year ended

December 31, 2022 2023. We consent to the incorporation by reference of said reports in the Registration Statements of Applied Optoelectronics Inc. on Form S-3 (File No. 333-234310) 333-269132 and on Forms S-8 (File No. 333-192407, File No. 333-217871, File No. 333-223347, File No. 333-230243, File No. 333-236831, File No. 333-253534, File No. 333-257009, File No. 333-253534, File No. 333-223347, File No. 333-230243, File No. 333-236831, File No. 333-217871, File No. 333-265711, File No. 333-272928, and File No. 333-236831) 333-273664).

/s/ GRANT THORNTON LLP

Houston, Texas

February 24, 2023 23, 2024

Exhibit 31.1

CERTIFICATION

I, Chih-Hsiang (Thompson) Lin, certify that:

1. I have reviewed this Annual Report on Form 10-K of Applied Optoelectronics, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 23, 2023 2024

/s/ CHIH-HSIANG (THOMPSON) LIN

CHIH-HSIANG (THOMPSON) LIN

President, Chief Executive Officer

Exhibit 31.2

CERTIFICATION

I, Stefan J. Murry, certify that:

1. I have reviewed this Annual Report on Form 10-K of Applied Optoelectronics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 23, 2023 2024

/s/ Stefan J. Murry

STEFAN J. MURRY

Chief Financial Officer

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Exhibit 32.1

CERTIFICATION

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Section 1350 of Chapter 63 of Title 18 of the U.S. Code (18 U.S.C. § 1350), Chih-Hsiang (Thompson) Lin, President and Chief Executive Officer of Applied Optoelectronics, Inc. (the "Company"), and Stefan J. Murry, Chief Financial Officer of the Company, each hereby certifies that, to the best of his knowledge:

1. The Company's Annual Report on Form 10-K for the period ended December 31, 2022 2023, to which this Certification is attached as Exhibit 32.1 (the "Annual Report") fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

2. The information contained in the Annual Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

In Witness Whereof, the undersigned have set their hands hereto as of the 24 23rd day of February, 2023 2024.

/s/ Chih-Hsiang (Thompson) Lin

CHIH-HSIANG (THOMPSON) LIN

President and Chief Executive Officer

/s/ Stefan J. Murry

STEFAN J. MURRY

Chief Financial Officer

This certification accompanies the Annual Report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Applied Optoelectronics, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Annual Report), irrespective of any general incorporation language contained in such filing.

Exhibit 97

APPLIED OPTOELECTRONICS, INC.

Incentive Compensation Recovery Policy

1. Purpose

The purpose of the Applied Optoelectronics, Inc. Incentive Compensation Recovery Policy (this "Policy") is to provide for the recovery of certain Incentive-Based Compensation in the event of an Accounting Restatement. This Policy is intended to comply with, and to be administered and interpreted consistent with, Section 10D of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), Rule 10D-1 promulgated under the Exchange Act ("Rule10D-1"), and Listing Rule 5608 adopted by the Nasdaq Stock Market LLC ("Nasdaq") (the "Listing Standards"). Unless otherwise defined in this Policy, capitalized terms shall have the meanings set forth in Section 10 below.

2. Policy for Recovery of Erroneously Awarded Compensation

In the event of an Accounting Restatement, it is the Company's policy that it will recover reasonably promptly the amount of any Erroneously Awarded Compensation Received by an Executive Officer during the Recovery Period.

3. Administration

- 3.1. This Policy shall be administered by the Compensation Committee, except that the Board may determine to act as the administrator or designate another committee of the Board to act as the administrator with respect to any portion of this Policy other than Section 3.3 (the "**Administrator**"). The Administrator is authorized to interpret and construe this Policy and to make all determinations necessary, appropriate, or advisable for the administration of this Policy.
- 3.2. The Administrator is authorized to take appropriate steps to implement this Policy and may effect recovery hereunder by: (i) requiring payment to the Company, (ii) set-off, (iii) reducing compensation, or (iv) such other means or combination of means as the Administrator determines to be appropriate.
- 3.3. The Company need not recover Erroneously Awarded Compensation if and to the extent that the Compensation Committee determines that such recovery is impracticable and not required under Rule 10D-1 and the Listing Standards because: (i) the direct expense paid to a third party to assist in enforcing this Policy would exceed the amount to be recovered after making a reasonable attempt to recover or (ii) recovery would likely cause an otherwise tax-qualified broad-based retirement plan to fail the requirements of Section 401(a)(13) or Section 411(a) of the Internal Revenue Code of 1986, as amended, and regulations thereunder.
- 3.4. Any determinations made by the Administrator under this Policy shall be final and binding on all affected individuals and need not be uniform with respect to each Executive Officer covered by this Policy.

4. Other Recovery Rights; Company Claims

Any right of recovery pursuant to this Policy is in addition to, and not in lieu of, any other remedies or rights of recovery that may be available to the Company under applicable law or pursuant to the terms of any other compensation recovery policy of the Company that may be in effect from time to time, including in any employment agreement, plan or award agreement, or similar agreement and any other legal remedies available to the Company. Nothing contained in this Policy and no recovery hereunder shall limit any claims, damages, or other legal remedies the Company may have against an individual arising out of or resulting from any actions or omissions by such individual.

5. Reporting and Disclosure

The Company shall file all disclosures with respect to this Policy in accordance with the requirements of federal securities laws.

6. Indemnification Prohibition

Notwithstanding the terms of any indemnification or insurance policy or any contractual arrangement that may be interpreted to the contrary, the Company shall not indemnify any Executive Officer with respect to amount(s) recovered under this Policy or claims relating to the enforcement of this Policy, including any payment or reimbursement for the cost of third-party insurance purchased by such individual to fund potential clawback obligations hereunder.

7. Amendment; Termination

The Board or the Compensation Committee may amend or terminate this Policy from time to time in its discretion as it deems appropriate and shall amend this policy as it deems necessary to comply with applicable law or any rules or standards adopted by a national securities exchange or association on which the Company's securities are listed; provided, however, that no amendment or termination of this Policy shall be effective to the extent it would cause the Company to violate any federal securities laws, Securities and Exchange Commission rule or the rules or standards of any national securities exchange or association on which the Company's securities are listed.

8. Successors

This Policy shall be binding and enforceable against all individuals who are or were Executive Officers and their beneficiaries, heirs, executors, administrators, or other legal representatives.

9. Effective Date

This Policy is effective only for Incentive-Based Compensation Received by an Executive Officer on or after the Effective Date.

10. Definitions

For purposes of this Policy, the following terms shall have the meanings set forth below:

- 10.1. "**Accounting Restatement**" means an accounting restatement of the Company's financial statements due to the Company's material noncompliance with any financial reporting requirement under the securities laws, including any accounting restatement required to correct an error in previously issued financial statements that is material to the previously issued financial statements, or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period.
- 10.2. "**Administrator**" has the meaning set forth in Section 3.1 hereof.
- 10.3. "**Board**" means the Company's Board of Directors.
- 10.4. "**Company**" means Applied Optoelectronics, Inc., a Delaware corporation, and its affiliates.
- 10.5. "**Committee**" means the Compensation Committee of the Board.
- 10.6. "**Effective Date**" means October 2, 2023.

- 10.7. **"Erroneously Awarded Compensation"** means the amount, as determined by the Administrator, of Incentive-Based Compensation received by an Executive Officer that exceeds the amount of Incentive-Based Compensation that would have been received by the Executive Officer had it been determined based on the restated amounts. For Incentive-Based Compensation based on stock price or total shareholder return ("TSR") the Administrator will determine the amount based on a reasonable estimate of the effect of the Accounting Restatement on the stock price or TSR upon which the Incentive-Based Compensation was received, and the Company will maintain documentation of the determination of that reasonable estimate and provide the documentation to Nasdaq. In all cases, the amount to be recovered will be calculated without regard to any taxes paid by the Executive Officer with respect to the Erroneously Awarded Compensation.
- 10.8. **"Executive Officers"** means the Company's current and former executive officers as determined by the Administrator in accordance with Rule 10D-1 and the Listing Standards. Generally, Executive Officers include any executive officer designated by the Board as an "officer" under Rule 16a-1(f) under the Exchange Act.
- 10.9. **"Financial Reporting Measure"** means (i) any measure that is determined and presented in accordance with the accounting principles used in preparing the Company's financial statements and any measure derived wholly or in part from such a measure, and (ii) any measure based wholly or in part on the Company's stock price or total shareholder return. A Financial Reporting Measure need not be presented within the Company's financial statements or included in a filing with the Securities and Exchange Commission.
- 10.10. **"Incentive-Based Compensation"** means any compensation granted, earned, or vested based in whole or in part on the Company's attainment of a Financial Reporting Measure that was Received by an individual (i) on or after the Effective Date and after such individual began service as an Executive Officer, (ii) who served as an Executive Officer at any time during the performance period for the Incentive-Based Compensation and (iii) while the Company had a listed class of securities on a national securities exchange or association.
- 10.11. Incentive-Based Compensation is deemed to be **"Received"** in the Company's fiscal period during which the Financial Reporting Measure specified in the Incentive-Based Compensation award is attained, even if the payment or grant of such Incentive-Based Compensation occurs after the end of that period.
- 10.12. **"Recovery Period"** means the three completed fiscal years immediately preceding the date that the Company is required to prepare the applicable Accounting Restatement and any "transition period" as described under Rule 10D-1 and the Listing Standards. For purposes of this Policy, the **"date that the Company is required to prepare the applicable Accounting Restatement"** is the earlier to occur of (i) the date the Board, a committee of the Board, or the officer or officers of the Company authorized to take such action if Board action is not required, concludes, or reasonably should have concluded, that the Company is required to prepare an Accounting Restatement, or (ii) the date a court, regulator, or other legally authorized body directs the Company to prepare an Accounting Restatement.

11. Acknowledgement by Executive Officer

Each Executive Officer shall sign and return to the Company an Acknowledgment Form substantially the form attached to this Policy as **Exhibit A** or in such other form determined by the Administrator, pursuant to which the Executive Officer agrees to be bound by, and comply with, the terms of this Policy.

EXHIBIT A

APPLIED OPTOELECTRONICS, INC.

Incentive Compensation Recovery Policy

ACKNOWLEDGEMENT FORM

I, the undersigned, acknowledge and affirm that I have received and reviewed a copy of the Applied Optoelectronics, Inc. Incentive Compensation Recovery Policy, and agree that: (i) I am and will continue to be subject to the Applied Optoelectronics, Inc. Incentive Compensation Recovery Policy, as amended from time to time (the **"Policy"**), (ii) the Policy will apply to me both during and after my employment with the Company, and (iii) I will abide by the terms of the Policy, including, without limitation, by promptly returning any Erroneously Awarded Compensation to the Company to the extent required by, and in a manner determined by the Administrator and permitted by, the Policy. In the event of any inconsistency between the Policy and the terms of any employment agreement or offer letter to which I am a party, or the terms of any compensation plan, program, or agreement under which any compensation has been granted, awarded, earned or paid, the terms of the Policy shall govern.

Capitalized terms used but not otherwise defined in this Acknowledgement Form shall have the meanings ascribed to such terms in the Policy.

Signature

Print Name

Date

DISCLAIMER

THE INFORMATION CONTAINED IN THE REFINITIV CORPORATE DISCLOSURES DELTA REPORT™ IS A COMPARISON OF TWO FINANCIALS PERIODIC REPORTS. THERE MAY BE MATERIAL ERRORS, OMISSIONS, OR INACCURACIES IN THE REPORT INCLUDING THE TEXT AND THE COMPARISON DATA AND TABLES. IN NO WAY DOES REFINITIV OR THE APPLICABLE COMPANY ASSUME ANY RESPONSIBILITY FOR ANY INVESTMENT OR OTHER DECISIONS MADE BASED UPON THE INFORMATION PROVIDED IN THIS REPORT. USERS ARE ADVISED TO REVIEW THE APPLICABLE COMPANY'S ACTUAL SEC FILINGS BEFORE MAKING ANY INVESTMENT OR OTHER DECISIONS.

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