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

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 001-38952

CAMBIUM NETWORKS CORPORATION

(Exact name of Registrant as specified in its Charter)

Cayman Islands	**Not Applicable**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
c/o Cambium Networks, Inc. **3800 Golf Road, Suite 360** **Rolling Meadows, Illinois**	**60008**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (345) 814-7600

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Ordinary shares, $0.0001 par value	CMBM	Nasdaq Global Market

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

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

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

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 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, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal controls 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 Exchange Act). YES ☐ NO ☒

The aggregate market value of the ordinary shares held by non-affiliates on June 30, 2022 (the last business day of the registrant's most recently completed second fiscal quarter), based on the last sale price of the common shares on that date of $14.65 was $175,028,150. For purposes of this calculation, shares held by Vector Capital and our Chief Executive Officer are deemed to be affiliates of the registrant and are excluded from the calculation.

As of February 23, 2023 there were 27,338,844 shares of the registrant's ordinary shares outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2022 Annual Meeting of Shareholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2022.

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Note regarding forward-looking statements

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the federal securities laws. All statements other than statements of historical fact contained in this Annual Report on Form 10-K, including statements regarding our future results of operations and financial position, business strategy and plans and objectives of management for future operations, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, forward-looking statements may be identified by terms such as "may," "should," "expects," "plans," "anticipates," "could," "intends," "target," "projects," "contemplates," "believes," "estimates," "predicts," "potential" or "continue" or the negative of these terms or other similar expressions. The forward-looking statements in this Annual Report on Form 10-K are only predictions. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this report and are subject to a number of risks, uncertainties and assumptions described in Item 1A, "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, they should not be relied upon as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Some of the key factors that could cause actual results to differ from our expectations include:

- the unpredictability of our operating results;
- our inability to predict and respond to emerging technological trends and network operators' changing needs;
- the impact of competitive pressures on the development of new products;
- the impact of actual or threatened health epidemics and other outbreaks including the impact of the COVID-19 pandemic;
- our limited or sole source suppliers' inability to acquire or produce third-party components to build our products and the impact of supply shortages, extended lead times or changes in supply of components and other parts required to manufacture our products;
- the impact of increases in logistics, freight and other shipping costs and constraints on logistics and shipping due to labor shortages, container shortages or other constraints;
- our reliance on third-party manufacturers, which subjects us to risks of product delivery delays and reduced control over product costs and quality;
- our reliance on distributors and value-added resellers for the substantial majority of our sales;
- the inability of our third-party logistics and warehousing providers to deliver products to our channel partners and network operators in a timely manner;
- our distributors' and channel partners' inability to attract new network operators or sell additional products to network operators that currently use our products;
- the technological complexity of our products, which may contain undetected hardware defects or software bugs or subject our products to the risks of ransomware or malware or other cyber attacks;
- our channel partners' inability to effectively manage inventory of our products, timely resell our products or estimate expected future demand;
- credit risk of our channel partners, which could adversely affect their ability to purchase or pay for our products;
- our inability to maintain an effective system of internal controls, produce timely and accurate financial statements or comply with applicable regulations;
- our reliance on the availability of third-party licenses;
- risks associated with international sales and operations including risks caused by political tensions;
- current or future unfavorable economic conditions, both domestically and in foreign markets; and
- our inability to obtain intellectual property protections for our products.

We caution you that the foregoing list may not contain all of the forward-looking statements made in this Annual Report on Form 10-K.

Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events or otherwise.

Summary Risk Factors

The following is a summary of the principal risks described below in Part I, Item 1A "Risk Factors" in this Annual Report on Form 10-K. We believe that the risks described in the "Risk Factors" section are material to investors, but other factors not presently known to us or that we currently believe are immaterial may also adversely affect us. The following summary should not be considered an exhaustive summary of the material risks facing us, and it should be read in conjunction with the "Risk Factors" section and the other information contained in this Annual Report on Form 10-K.

- Our operating results can be difficult to predict and may fluctuate significantly, which could result in a failure to meet investor expectations or our guidance and a decline in the trading price of our shares.
- The introduction of new products and technology is key to our success, and if we fail to predict and respond to emerging technological trends and network operators' changing needs, we may be unable to remain competitive.
- Competitive pressures may harm our business, revenues, growth rates and market share.
- We face risks related to actual or threatened health epidemics and other outbreaks, which could significantly disrupt our manufacturing, sales and other operations.
- We rely on third-party manufacturers, which subjects us to risks of product delivery delays and reduced control over product costs and quality.
- We require third-party components, including components from limited or sole source suppliers, to build our products. The unavailability of these components could substantially disrupt our ability to manufacture our products and fulfill sales orders.
- Supply shortages for key components in our products may result in extended lead times or supply changes, which could disrupt or delay our scheduled product deliveries to our end customers and may result in the loss of sales and end customers.
- We may face increased costs or other logistics challenges in the shipment of our products, which may increase cost of revenues or result in a delay of shipments to customers.
- We outsource manufacturing to third-party manufacturers operating outside of the U.S., subjecting us to risks of international operations.
- We rely on distributors and value-added resellers for the substantial majority of our sales, and the failure of our channel partners to promote and support sales of our products would materially reduce our expected future revenues.
- Our third-party logistics and warehousing provider may fail to deliver products to our channel partners and network operators in a timely manner, which could harm our reputation and operating results.
- Our ability to sell our products is highly dependent on the quality of our support and services offerings, and our failure to offer high-quality support and services could have a material adverse effect on our business, operating results and financial condition.
- Our gross margin varies from period to period and may decline in the future.
- Our products are technologically complex and may contain undetected hardware defects or software bugs, which could result in increased warranty claims, increased costs, loss of revenues and harm to our reputation.
- If our channel partners do not effectively manage inventory of our products, fail to timely resell our products or overestimate expected future demand, they may reduce purchases in future periods, causing our revenues and operating results to fluctuate or decline.
- If we are not able to effectively forecast demand or manage our inventory, we may be required to record write-downs for excess or obsolete inventory.
- A portion of our revenues are generated by sales to government entities, which are subject to a number of challenges and risks.
- We generate a significant amount of revenues from sales outside of the United States, and we are therefore subject to a number of risks associated with international sales and operations.
- A substantial portion of our product portfolio relies on the availability of unlicensed RF spectrum and if such spectrum were to become unavailable through overuse or licensing, the performance of our products could suffer and our revenues from their sales could decrease.

- New regulations or standards or changes in existing regulations or standards in the United States or internationally related to our products may result in unanticipated costs or liabilities, which could have a material adverse effect on our business, results of operations and future sales.
- We are subject to governmental export and import controls that could impair our ability to compete in international markets and subject us to liability if we are not in compliance with applicable laws.
- We do business in countries with a history of corruption and transact business with foreign governments, which increases the risks associated with our international activities.
- If we fail to comply with environmental requirements, our business, financial condition, operating results and reputation could be adversely affected.
- If we are not able to satisfy data protection, security, privacy and other government- and industry-specific requirements or regulations, our business, results of operations and financial condition could be harmed.
- Our actual or perceived failure to adequately protect personal data could result in claims of liability against us, damage our reputation or otherwise materially harm our business.
- Cyber-attacks, data breaches or malware may disrupt our operations, harm our operating results and financial condition, and damage our reputation or otherwise materially harm our business; and cyber-attacks or data breaches on our customers' networks, or in cloud-based services provided by or enabled by us, could result in claims of liability against us, damage our reputation or otherwise materially harm our business.
- Vulnerabilities and critical security defects, prioritization decisions regarding remedying vulnerabilities or security defects, failure of third-party providers to remedy vulnerabilities or security defects, could result in claims of liability against us, damage our reputation, or otherwise materially harm our business.
- Claims by others that we infringe their intellectual property rights could harm our business.
- If our third-party manufacturers do not respect our intellectual property and trade secrets and produce competitive products using our design, our business would be harmed.
- Our operating results may be adversely affected and damage to our reputation may occur due to production and sale of counterfeit versions of our products.
- We use open source software in our products that may subject our firmware to general release or require us to re-engineer our products and the firmware contained therein, which may cause harm to our business.
- Adverse economic conditions, continuing uncertain economic conditions or reduced information technology and network infrastructure spending may adversely affect our business, financial condition, result of operations and prospects.
- We are exposed to fluctuations in currency exchange rates, which could adversely affect our business, financial condition, results of operations and prospects.
- Enhanced United States tax, tariff, import/export restrictions, Chinese regulations or other trade barriers may have a negative effect on global economic conditions, financial markets and our business.
- Because Vector Capital holds a controlling interest in us, the influence of our public shareholders over significant corporate actions will be limited.
- Because we are incorporated under Cayman Islands law, shareholders may face difficulties in protecting their interests, and the ability to protect rights through U.S. courts may be limited.
- Our reputation and/or business could be negatively impacted by ESG matters and/or our reporting of such matters.

Trademarks and Service Marks

"Cambium", "Cambium Networks", "cnPilot", "cnMaestro", 'cnMedusa", "cnArcher", "cnReach", "cnHeat", "cnRanger", "cnWave", "cnVision", "LinkPlanner", "Xirrus", "Canopy" and "cnMatrix", the Cambium and Xirrus logos and other trademarks or service marks of Cambium Networks, Ltd. appearing in this Annual Report are the property of Cambium Networks Corporation. This Annual Report contains additional trade names, trademarks and service marks, which are the property of their respective owners.

PART I

Item 1. Business.

Business Overview

What we do

Cambium Networks is a global technology company that designs, develops, and manufactures wireless broadband and Wi-Fi networking infrastructure solutions for a wide range of applications, including broadband access, wireless backhaul, Industrial Internet of Things (IIoT), public safety communications and Wi-Fi access. Our products are used by businesses, governments, and service providers to build, expand and upgrade broadband networks. Our product lines fall into three broad, interrelated categories: Fixed Wireless Broadband (FWB), Enterprise networking, and Subscription and Services. The FWB portfolio spans point-to-point (PTP) and point-to-multi-point (PMP) architectures over multiple standards, including IEEE 802.11 and 3GPP (Third Generation Partnership Program), and frequency bands, including licensed, unlicensed and lightly licensed spectrum. The Enterprise portfolio includes Wi-Fi access points, wireless aware switches, and other networking devices.

The Subscription and Services portfolio includes network planning and design as well as cloud or on-premises network management and control. The latter capability, delivered through subscription to cnMaestro™ X, forms the foundation of our ONE Network, a cloud-based network management architecture that allows users to remotely configure, monitor, and manage their wireless network. It provides a single, centralized view of all network devices, including both FWB and Enterprise, as well as real-time performance and usage data, and allows users to make changes to the network configuration and settings. Advanced services offered in conjunction with this platform include application visibility and control which is used to optimize end user experiences; integrated security gateway and SD-WAN for small and medium business; and automated and intelligent network optimization.

Our strategy

Our strategy is to enable our customers to build broadband and internet access networks that deliver exceptional digital experiences at an affordable total cost of ownership. The foundation of our strategy is the Cambium ONE Network which brings integration and automation to our entire portfolio. It removes a great deal of complexity, making it easier to plan, deploy and operate a broadband network from core to edge, using a wide range of wireless technologies, standards, and radio frequency (RF) spectrum.

Our software and other tools enable network services that address a primary operating cost and constraint to growth faced by most network operators. Our approach is to simplify and automate the design, deployment, optimization, and management of broadband and Wi-Fi access networks through intelligent automation. For example, the policy-based automation feature on our cnMatrix switches enables the establishment of policies for each end-point device type and then automatically propagates those policies across all switch ports in the network, regardless of the actual port each device is plugged into.

Managing operating expenses, such as energy consumption, is increasingly of importance to network operators. Our solutions can aid in the reduction of energy consumption costs by requiring fewer devices to operate the network to achieve a given coverage and capacity. Our portfolio does not have the overhead required for mobile infrastructure that can contribute to energy consumption. For example, where electricity is unreliable or not available, our purpose-built FWB products have been successfully deployed using only solar and battery power.

In our product development we strive to minimize capital outlays required by end users of our products. First, we innovate on top of industry standard technologies to optimize the performance per dollar invested in the network. Second, our software-defined radios, with their ease of remote configuration via cnMaestro, together with our commitment to backward compatibility, extends the life of our products, while also minimizing truck-rolls otherwise needed by the end user to configure and install new products.

Increasingly, performance and cost are important metrics for most network operators. A key differentiation between network products and services providers for most network operators will be the availability of integrated services layered on top of the network. We enable our end users to customize networks with bespoke or third-party services provided by or enabled by us.

Meeting new trends

The post-COVID era has redefined the workspace in the midst of a rebalancing between the enterprise and home. Businesses and individuals both expect seamless, secure communication and connectivity, whether from the conference room or the living room. The number of applications and devices on the network - from gaming, streaming media, and home automation, to enterprise applications running in the cloud, as well as applications that enhance automation and security, will continue to increase on a global basis. Some applications need more bandwidth. Other applications need lower latency.

As a result of continuing of labor shortages across industries, businesses are leveraging IIoT devices in digital transformation initiatives. Increasingly, wireless broadband is being chosen over fiber or CAT5 to economically connect security cameras. Simultaneously, networking technologies and standards continue to iterate, providing new capabilities and choice points for network

operators. The result is a network edge that has evolved from a static connection to a highly complex, constantly evolving platform supporting a growing array of services.

Our FWB and Wi-Fi access, switching technologies, and software are designed to be cost-efficient and deliver high-quality digital experiences and device connectivity around the world. Our goal is to enable edge-of-the-network intelligence and the ability to adapt and respond to change. We are building and enabling a suite of services, deployed at scale with minimal human intervention, that will enable the network to be dynamic.

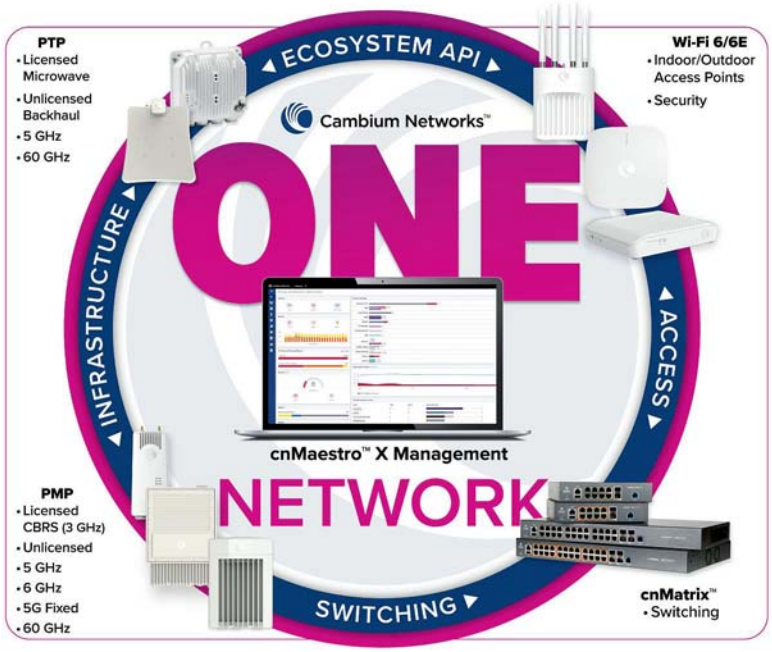
Expanding our addressable markets

Today, fierce competition to provide broadband access in rural, suburban, and urban markets is driving down subscription prices while simultaneously driving up performance requirements. We expect to respond to growing trends such as the following:

- *The implementation of broadband networks comprised of both fiber and wireless solutions*. WISPs are adding fiber to their networks while wireline and mobile operators are adding FWB to extend their network where fiber, or mobile-based fixed wireless, is not viable. Our newly released 5G Fixed solution along with the upcoming release of 6 GHz spectrum will give broadband operators even more opportunity for cost-effective network expansion.
- *FWB as an alternative to fiber*. Our enterprise and state and local government customers are discovering that street-level high-speed FWB networks, taking advantage of buildings and streetlights rather than towers, is an economically compelling alternative to fiber, and enables accelerated time to service when outdoor connections are needed to backhaul Wi-Fi and/or security cameras. For example, the combination of FWB and Wi-Fi has been successfully deployed in national parks and campgrounds.
- *Growth of enterprise networking managed services*. The market for enterprise networking managed services for hospitality and high density living, such as apartment buildings and senior living, is expanding. Our solutions are designed to enable managed service providers to cost effectively deploy and manage high value offerings for multiple hospitality or multi-dwelling unit clients using the MSP dashboard within cnMaestro X.
- *Applications for national defense and security initiatives*. We are actively engaged with national defense connectivity initiatives, working closely with systems integration partners. Although we have focused on high-capacity PTP FWB networking solutions, national government network operators have an equal need for the same FWB, Wi-Fi, switching, and value-added services as municipal, state, enterprise, and industrial network operators, although with added requirements for information assurance, security and other domain specific attributes.

Our technology and products

Our ONE Network strategy takes advantage of advances in wireless standards, software defined radios and open Application Programming Interfaces (APIs) to enable the centralized management of a range of network technologies. Our products and services enable network operators to build a platform using heterogeneous wireless technologies without requiring a separate management platform for each one. Our addition of intelligent automation improves operational performance and efficiency in networks that include our products' ability to optimize the network at the application layer, enabling our products to enhance network performance.



Point-to-Point (PTP) fixed wireless backhaul

Our PTP solutions are typically connected to high-speed, high-bandwidth wireline or fiber networks, and provide wireless broadband backhaul to a facility, a networked device, or to a PMP access point. Our PTP solutions can be deployed throughout a network over distances of more than 100 kilometers and provide speeds greater than 5 Gbps.

We offer PTP solutions that are designed to operate in unlicensed spectrum from 220 MHz to 5.9 GHz and 57 to 66 GHz, and in licensed spectrum from 6-38 and 71-86 GHz. In addition, our PTP 700 operates in NATO Band IV from 4.4-5.9 GHz, as well as in the 7 GHz and 8 GHz bands, and meets stringent federal operating, performance, and security standards. The mainstay of our backhaul offering is the PTP 670 for commercial applications and PTP 700 for defense and national security applications. In addition, our PTP 820 and 850 series offers carrier-grade microwave backhaul in licensed spectrum, and our PTP 550 offers price-performance leadership in spectral efficiency in sub-6 GHz unlicensed spectrum.

In addition to dedicated point-to-point platforms, as technology has evolved, solutions have developed that while principally supporting point-to-multi-point architectures, also support point-to-point applications, including the recently introduced 60 GHz cnWave V3000 and the ePMP Force 425. Revenues from these products are included in the PMP product category in our revenues by product category reporting, as that is their primary application.

Point-to-Multipoint (PMP) fixed wireless

Our PMP solutions extend wireless broadband access from tower mounted FWB access points to customer premise equipment (CPE) providing broadband access to residences and enterprises covering wide areas with a range of 10 to 30 kilometers. Our PMP solutions are increasingly used to backhaul video surveillance systems and public Wi-Fi.

Our PMP portfolio ranges from our PMP 450 series to our ePMP solutions for network operators that need to optimize for both price and performance to our cnReach family of narrow-bandwidth connectivity products for industrial communications. The PMP 450 series is optimized for performance in high-density and demanding physical environments, and includes the PMP 450m with integrated cnMedusa massive multi-user multiple input/multiple output, or MU-MIMO, technology. The PMP 450 product line also supports the FCC's Citizen Broadband Radio Service, or CBRS. The FCC completed the auction of CBRS Priority Access Licenses, or PAL, in the third quarter of 2020, complementing the existing availability of General Authorized Access, or GAA, licenses. Network operators are adopting the PMP 450 solution to exercise both PAL and GAA licenses.

For less demanding environments, ePMP provides a high-quality platform at a more affordable price. The ePMP 3000 supports 4x4 MU-MIMO and is complemented by a broad portfolio of ePMP Force 300 subscriber radios. In December 2022, we commenced commercial shipment of the ePMP 4600 series, which utilizes the 6 GHz band, expected to be commercially released by the FCC and other regulatory bodies around the world in 2023.

cnRanger, our Fixed LTE solution, operated in the 2 GHz (Bands 38, 40, 41) and 3 GHz (Bands 42, 43, 48). Like the PMP 450 platform, the 3 GHz cnRanger solution supports the CBRS service, while the 2 GHz bands support the FCC's Educational Broadband Service, or EBS, classification.

Our cnReach IIoT solutions offer connectivity for distributed sensors and controls across industrial deployments, delivering real-time monitoring, measurement and analytics to optimize system performance. Our products can be deployed in a variety of industrial verticals such as oil and gas, electrical utilities, water management, rail and transportation operations and smart cities. cnReach focuses on SCADA systems for process control and monitoring, providing affordable, narrowband wireless connectivity, operating below 1 GHz, to support distribution automation, substation switches, circuit control and telemetry.

In the fourth quarter of 2020, we began shipping our 60 GHz solution, cnWave, which enables Gbps networking using the 60 GHz band and a distributed architecture that enables scaled networks with dynamic routing for reliability and resiliency.

In 2022, we commenced commercial shipments of 28 GHz cnWave 5G Fixed, which operates in the 3GPP n257 (26.50 – 29.50 GHz), n258 (24.25 – 27.50 GHz), and n261 (27.50 – 28.35 GHz) bands. The platform incorporates both uplink and downlink MU-MIMO to optimize data rate to the CPE for residential and enterprise customers.

Enterprise solutions

Our Enterprise portfolio includes our cloud-managed Wi-Fi solutions, our cnMatrix cloud-managed wireless-aware switching solution, our Xirrus Wi-Fi solutions, and our Wi-Fi 6 portfolio of Wi-Fi 6 access points which support both cnMaestro and Xirrus XMS management.

Our enterprise-grade Wi-Fi 6/6E solutions provide distributed access to individual users or devices in indoor settings, such as office complexes, and outdoor settings, such as private spaces and outdoor public Wi-Fi hotspots, over distances from two meters to 1 kilometer with high capacity. Our Wi-Fi access point portfolio includes solutions enterprise, government, education, small business and home applications and offers a range of Wi-Fi access points and RF technology that enable network optimization based on desired geographic coverage and user density.

In June 2020, we introduced our first Wi-Fi 6 access point, the XV3-8, which supports both cnPilot and Xirrus solutions. In 2021 and 2022 we continued to extend our Wi-Fi 6/6E portfolio, including the addition of the XE5-8, a five-radio Wi-Fi 6/6E 8×8/4×4 access point (AP) designed to deliver high-density, future-proof performance for building next generation wireless networks. With five user servicing radios, the XE5-8 delivers the highest density Wi-Fi 6 solution in the industry. Wi-Fi 6E support extends the capacity of Wi-Fi into the 6 GHz band, more than tripling the wireless spectrum available. In 2022, we also introduced the XV2-22H Wi-Fi 6 Wall Plate Access Point. The XV2-22H indoor Wi-Fi 6 AP offers 2.97 Gbps of bandwidth and an integrated switch. Ideal for hospitality, MDU, education, and small/medium business applications.

The following table shows a summary of our product portfolio:

Cambium Networks Product Portfolio Summary							
Network Management	cnMaestro X - Cloud-Based Management Software						
Network Services	QoE and NSE 3000 Advance Services Platforms						
Wired Interface	cnMatrix - Wireless Aware Switching						
Product Platform	PTP 820/850	PTP 550/670/700	PMP 450	ePMP	cnWave	Wi-Fi 6/6E	cnReach
Design Focus	Licensed Microwave Backhaul	Industry Leading Sub-6 GHz Backhaul Performance	Unparalleled Scalability for Multipoint networks	Price/Performance PTP and PMP Leadership	Gb to the Edge for Urban, high-density Suburban, and Rural markets	Software Defined Radios, Cloud Managed, High Performance	Licensed Narrowband in rugged I/O rich package
Throughput	2+ Gbps	450 - 1400 Mbps	1.4 Gbps/Sector	1.2 Gbps/ Sector	15 Gbps/DN 3 Gbps/BTS	1+ Gbps/AP	KB to MB
Spectrum (GHz except as noted)	6 - 38	4.400 - 5.925 7.125 - 8.500	900 MHz, 2.4, 3, 5	2.4, 5, 6.4	24.25 - 29.50 57 - 66	2.4, 5, 6	220, 450, 700, 900 MHz

Ethernet Switches

Our cnMatrix Ethernet enterprise switching solutions simplify network deployment and operation. cnMatrix provides the intelligent interface between wireless and wired networks. cnMatrix's policy-based automation (PBA) accelerates network deployment, mitigates human error, increases security, and improves reliability. When deployed with Cambium Networks Wi-Fi access points and the cnMaestro management system, network operators have an affordable, feature-rich, high-quality unified wired/wireless enterprise grade network. In the first quarter of 2021, we introduced and began shipping the cnMatrix TX 2020R-P. The TX 2020R-P is the first of a series of switches designed specifically to support PMP and PTP fixed wireless broadband networks, incorporating the cnMatrix enterprise-class feature set and incorporating additional features and services pertinent to network operators deploying fixed wireless broadband networks. The TX 2012R-P was introduced in April 2021 and is the second platform in the TX series.

Network Management Platform

Our cloud-based cnMaestro and cnMaestro X network management platform provide users with an integrated, intelligent, easy to use tool for end-to-end network management of our portfolio from the network operating center to be managed to the edge of the network by an individual CPE. cnMaestro's interface allows users to easily onboard large numbers of new devices, configure existing devices, monitor the entire network and troubleshoot.

We have recently introduced two subscription services that complement and rely on cnMaestro: Network Service Edge (NSE 3000), and Quality of Experience (QoE). Network Service Edge delivers advanced security, network, and SD-WAN services for small and medium enterprise networks. These services are integrated into Cambium's ONE Network solution that enables organizations to deploy and manage security policies across the wireless and wired network, all fully managed and controlled as part of a single framework.

Our QoE solution is hardware agnostic, operating across both wireless and fiber networks, and offers a range of services to network operators utilizing our networking solutions as well as third-party competitive offerings. The subscription-based solution includes granular application shaping, dynamic queue-based rate limiting, congestion management and application insights, which provides broadband service providers immediate access to the information and controls to optimize end user experiences and be the service provider of choice.

Our network planning tools include cnHeat and LINKPlanner. cnHeat is a network planning subscription service that provides a heat map coverage model display of locations that are available for FWB connectivity that aids in network planning. cnHeat utilizes LiDAR or equivalent geospatial data to accurately model the geography being evaluated, coupled with highly accurate RF modeling, to render a visual and quantitative assessment of anticipated RF coverage and performance. cnHeat allows network operators to optimize site selection for coverage, supporting their total cost of ownership and return on investment. LINKPlanner is a comprehensive tool, developed over the past 12 years, used to plan PTP and PMP networks. LINKPlanner allows users to visualize and analyze hypothetical network deployment scenarios to evaluate performance and reliability allowing for cost-effective expansion and deployment of their networks. cnArcher is a smartphone app that accelerates installation and deployment of our fixed wireless products by field technicians.

Sales and marketing

We sell our products primarily through a network of distributors who sell to other channel partners, including value-added resellers, system integrators, and end customers (end users), as well as through our direct sales force. End users include public or private network operators, including broadband and/or wireless LAN managed service providers; broadband internet service providers; mobile network operators; mid-market enterprises, such as education, hospitality, multi-dwelling units, and retail; state and local government; industrial, including energy, mining, rail operators and utilities; and military agencies. Channel partners may work directly with end users to identify their networking needs and they may also provide installation, configuration, and ongoing support services. As of December 31, 2022, we had over 12,600 channel partners, which includes over 160 distributors.

Our sales organization typically engages directly with large Internet service providers and enterprise managed service providers and certain enterprises even though product fulfillment generally is provided by our channel partners. We also engage in joint selling and marketing with our service provider, system integrator, and reseller channel partners to their customers' end users. Our sales organization includes field and inside sales personnel, as well as regional technical managers with deep technical expertise who are responsible for pre-sales technical support and solutions engineering for internet service providers, enterprise networking managed service providers, systems integrators and resellers. As of December 31, 2022, we had 134 sales personnel located in 20 countries.

Our distributors play a central role by promoting and distributing our products in target vertical markets, providing value-added support to the service providers and reseller channels by bringing core strengths in technical support and professional services. This is in addition to logistics, and sales and marketing support. Our distributors typically stock and manage inventory of our products.

We typically work with channel partners through our Connected Partner program, which is a structured program designed to support and enable partners to sell and support our products. The program includes training and education, marketing support,

technical support, and other resources such as product discounts, deal registration, demonstration equipment, virtual and in-person events, and promotions to help channel partners succeed in selling and supporting our products.

Our marketing activities can be Cambium Networks led as well as distributor or channel partner led. Our marketing activities are focused on building brand awareness and generating leads with our target market segments of service providers, enterprise, industrial, and government. In addition, we work with our distributors and other channel partners to enable joint marketing that targets the enterprise end users. We leverage a broad mix of communications platforms including website and social media presence, public relations, webinars, trade shows and private events.

Customer support

We provide multiple layers of support: technical support, information-sharing with an experienced community of users, software downloads, warranty services, and repair. We support our enterprise class solutions with a range of flexible service plans and optional 24/7 availability that provide assurance to network operators that their always-on, mission critical communications requirements will be met. With every product purchase, we provide technical support on a best-effort basis. Hardware issues are diagnosed via joint troubleshooting with the end user, and the issue will be addressed according to standard warranty status and the root cause of the issue. This may be sufficient for some customers who can largely manage and operate their network without assistance and hold adequate spares. For others, we provide three support programs staffed by our skilled technical support team and product support engineers to keep the network operating smoothly and efficiently and may provide 24x7x365 technical support and premium warranty support and allow network operators to select the service level that best meets their needs. Our support organization both supports channel partners in supporting their direct customers and provides first-line support to our direct customers. Technical support is also available on-line via chat and automated ticketing systems.

Training

We provide a wide range of training and educational material, from comprehensive user guides and installation guides, to self-directed interactive training, to in-person instructor-led immersion courses to ensure our end-users and channel partners are familiar with the design, implementation, usage, and management of our products. The training and certification system is administered through a learning management system that provides the user a record of course work, exam results, certifications and access to on-demand self-directed training resources that complement instructor-led sessions scheduled frequently around the world.

Cambium Community Forum

The Cambium Networks Community Forum is a platform for users of our solutions to connect with each other, ask questions, and share information and experiences. It is a place where users can find help and support, as well the latest developments and features of Cambium Networks products. The forum is also a place where users can share their own tips and best practices for using our products, and where they can stay up to date with the latest news and updates from us.

Our Community Forum is moderated by our staff with direct and active engagement by our development engineering and product management personnel. Leveraging the Community Forum, we collect network operator and channel partner feedback on potential product improvements and new product ideas, including through the administration of beta testing on our products. As of December 31, 2022, there were approximately 46,000 registered forum members on our Community Forum.

Manufacturing and supply

We rely on third-party contract manufacturers and original design manufacturers for our manufacturing requirements. Our global sourcing strategy emphasizes the procurement of materials and product manufacturing in competitive geographies. For some of our products, we do substantially all of the design work; for other products, we outsource both the design (in whole or in part) and the manufacture of the product; and for several products we distribute and sell a product designed and manufactured by a third party under our name on a white label basis. We generally require that the manufacturing processes and procedures are certified to International Organization for Standardization ("ISO") 9001 standards.

Our third-party manufacturers typically procure the components needed to build our products based on our demand forecasts. These forecasts represent our estimates of future demand for our products based on historical trends and analyses from our sales and product management functions as adjusted for overall market conditions. Generally, for our primary third-party manufacturers, we update these forecasts monthly. This allows us to leverage the purchasing power of our third-party manufacturers. Our products rely on key components, purchased from a limited number of suppliers, including certain sole source providers. Lead times for materials and components vary significantly, and depend on factors such as the specific supplier, complexity, contract terms, demand and availability of a component at a given time. From time to time, we may experience price volatility or supply constraints for certain components that are not available from multiple qualified sources or where our suppliers are geographically concentrated. We, like the rest of our industry, have experienced shortages in semiconductors and other key components used for our hardware, which have driven increased costs for components and shipping. To alleviate shortages, we have and may continue to purchase certain scarce components directly on the open market. We may also acquire component inventory in anticipation of supply constraints and enter

into longer-term pricing commitments with vendors to improve the priority, price and availability of supply. In periods of shortages, we have in the past and may in the future need to build inventory of select components.

We outsource the warehousing and delivery of our products at these fulfillment facilities to a third-party logistics provider for worldwide fulfillment. Our direct fulfillment facilities are in Louisville, Kentucky, Venlo, Netherlands and Shanghai, China from where we ship to our distributor partners and network operators.

Research and development

Our research and development organization is located primarily in San Jose and Thousand Oaks, California, Rolling Meadows, Illinois, Ashburton, United Kingdom and Bangalore, India. We also work with contract engineers in various locations globally. Our research and development team has deep expertise and experience in wireless technology, antenna design and network architecture and operation. We expect to continue to expand our product offerings and solutions capabilities in the future and to invest significantly in continued research and development efforts.

Intellectual property

Our success depends in part on our ability to protect our core technology and innovations. We rely on federal, state, common law and international rights, as well as contractual restrictions, to protect our intellectual property. We control access to our proprietary technology by entering into confidentiality and invention assignment agreements with our employees and contractors, and confidentiality agreements with third parties, such as Internet service providers, vendors, individuals and entities that may be exploring a business relationship with us. In addition to these contractual arrangements, we also rely on a combination of trade secrets, copyrights, patents, trademarks, service marks and domain names to protect our intellectual property. We pursue the registration of our trademarks, service marks and domain names in the United States and England and in certain other locations outside of these jurisdictions. These laws, procedures and restrictions provide only limited protection and the legal standards relating to the validity, enforceability and scope of protection of intellectual property rights are uncertain and still evolving. Furthermore, effective patent, trademark, copyright and trade secret protection may not be available in every country in which our products are available.

We seek patent protection for certain of our key innovations, protocols, processes and other inventions. As of December 31, 2022, we had 42 issued U.S. patents and 149 patents issued in various foreign jurisdictions as well as 9 U.S. and 41 foreign patent applications pending. We file patent applications in the United States and other countries where we believe there to be a strategic technological or business reason to do so. Although we actively attempt to utilize patents to protect our technologies, we believe that none of our patents, individually, are material to our business.

Competition

The markets for FWB and Enterprise solutions are highly competitive and subject to rapid technological change. We compete in a wide range of related categories, each with its set of competitors worldwide that vary in size and in the products and solutions offered. We expect competition to persist, intensify and increase in the future. We review our competitive situation as follows:

- Our cnMaestro network management solution has the ability to manage both FWB edge networking devices (e.g., Wi-Fi, switching), and quality of experience and network security services, in a coordinated and centralized manner. In addition, its northbound APIs enable operators to integrate specialized services on top of their Cambium Networks infrastructure. As networks become more diverse and complex, cnMaestro's capability will increasingly become a competitive strength.
- Our competitors for products and solutions for unlicensed wireless broadband in the sub-7 GHz spectrum bands include Ubiquiti, Tarana, Airspan, Radwin, MikroTik, Ligowave, and HFCL Group. Competitors in the 3.5 GHz spectrum band, the Citizens Broadband Radio Service in FCC-governed markets, include Airspan, but also Ericsson, Nokia, Baicells, and Telrad. Our cnWave 60 GHz mmWave point-to-point and point-to-multi-point products compete with Ubiquiti, MikroTik, Siklu, Adtran, and Edgecore.
- The landscape for broadband services using licensed spectrum is different. Our competitors in the licensed point-to-point microwave market include Aviat Networks, Ceragon, SIAE, NEC, and SAF Technica, among others. Our cnWave 5G fixed (28 GHz) products compete with Intracom, Ericsson, Nokia, and Samsung.
- Our home Wi-Fi routers are offered to subscribers by our fixed wireless service provider customers. These devices compete with all consumer-grade, home Wi-Fi brands.
- Broadband service providers are increasingly finding the need to manage network performance at the application level. An example is prioritizing Netflix vs. online game download vs. Zoom. We offer a subscription to a cloud-based tool that enables operators to accomplish this task regardless of the hardware deployed (it works with our equipment as well as equipment by other manufacturers in the network). Competitors to this offering include Preseem, and Sandvine (including Prosera Analytics which was purchased by Sandvine).

- Our cnReach narrowband fixed wireless IIoT products and solutions compete principally with GE MDS and Freewave.
- The success of a FWB network is highly dependent on accurately predicting the performance of each link before it is deployed. We offer a subscription to a cloud-based tool called cnHeat which leverages LiDAR data to build highly accurate link forecasts. The primary competitor to cnHeat is TowerCoverage.com. There are also offerings for LiDAR heatmaps from Google and Cloud RF.
- Our enterprise network edge solutions, which include Wi-Fi, cnMatrix ethernet switching, and Network Services Edge (NSE) products compete with a wide range of competitors, in some cases the competitor competing with two or more of our products. Ruckus (CommScope), Ubiquiti, Meraki (Cisco), Extreme Networks, Aruba (HPE), Fortinet, Mist (Juniper), and Ruiji, are competitors to our Wi-Fi Access Point portfolio. Our cnMatrix wireless aware ethernet switch platform competes with Ubiquiti, MikroTik, Cisco, and HPE, among others. Our cnMaestro X network management solution competes with each competitive manufacturers' management platform at a device-level, but also with system-level solutions developed in-house, or commercial solutions.

As our target markets continue to develop and expand, and as the technology for wireless broadband and enterprise networking continues to evolve, we expect competition to increase from both established and emerging market participants.

The market for our products and solutions is influenced by a variety of factors, including the following:

- Total cost of ownership and return on investment associated with the solutions;
- Ease of configuration, installation, and use of the solution;
- Ability to provide a backward compatible solution;
- Broad application across a range of use cases and frequencies;
- Product quality, functionality and reliability;
- Ability to allow centralized management of the solutions to enable better network planning, including scalable provisioning, configuration, monitoring and complete network visualization;
- Ability to enable operators to profitably compete on both price and service levels and
- Ability to provide quality, full service pre- and post-sales product support.

We believe we compete favorably on each of these factors.

Regulatory requirements

In addition to regulations of general application to global businesses, we are subject to a number of regulatory requirements specific to our industry, including, without limitation:

- Radio frequency usage. Because our products transmit energy in RF spectrum, our products are subject to:
  - rules relating to RF spectrum allocation and authorization of certain radio equipment issued by the Federal Communications Commission for non-federal uses or the National Telecommunications and Information Administration for federal uses; and
  - local type approval, or homologation, rules requiring confirmation that our products meet minimum regulatory, technical and safety requirements prior to sale in various countries around the world, for example: European Technical Standards Institute (ETSI), Industry Canada (IC) and Agencia National De Telecommunicatoes (Anatel).

The applicable regulatory agencies in each jurisdiction adopt regulations to manage spectrum use, establish and enforce priorities among competing uses, limit harmful radio frequency interference and promote policy goals such as broadband deployment. These spectrum regulations regulate allocation, licensing, and equipment authorizations. Since our customers purchase devices to operate in specific spectrum bands allocated by the regulatory authorities, our products must meet the technical requirements set forth for such spectrum allocation(s).

In some bands, the operator, such as our customer, must seek prior regulatory authority to operate using specified frequencies, and the resulting spectrum license authorizes the licensee, for a limited term, to operate in a spectrum consistent with licensed technical parameters within a specified geographic area. We must design and manufacture our products to comply with these technical parameters.

Our products generally are subject to compliance testing prior to approval, and, as a condition of authority in each jurisdiction, we must ensure that our products have the proper labels and documentation specifying such authority. We generally use

telecommunications certification bodies to obtain certification for our devices in each jurisdiction in which we intend to market and sell our products.

- Trade compliance requirements. We are subject to compliance with rules in jurisdictions from which we export or into which we import our products, including export control and reporting, import clearance, anti-bribery, antitrust and competition rules and regulations, including:
    - Import and export requirements issued by the United States, the European Union or other jurisdictions, including, for example, the U.S. Department of Commerce, the Office of Foreign Assets Control, the U.K. Foreign, Commonwealth & Development Office, Ministry of Defense and Department of International Trade including rules banning sales to persons or entities on applicable designated parties lists, or to persons or entities in embargoed countries, rules requiring export licenses prior to sales of products incorporating encryption technology to certain end users, and local rules governing import of products, including packaging and labeling laws. In addition, some of our products include enabled encryption technology, which may require us to obtain a license prior to a sale to certain foreign agencies. These rules require us to monitor databases and establish and enforce policies to prohibit the sale of our products to, embargoed persons, entities and countries.
    - Rules and regulations, particularly in the United States and the European Union, governing environmental matters that restrict the use of certain dangerous substances in electrical or electronic equipment, govern use of certain chemical substances throughout their lifecycle and Waste Electrical and Electronic Equipment, Directive 2012/2019/EU, related to the collection, treatment, recycling and recovery of waste electrical and electronic equipment in the European Union and related laws elsewhere. These rules govern our use of components in our products, requiring us to comply with environmental rules and regulations in our selection of component parts and in the manufacturing process, as well as over the disposal upon destruction or retirement of our products.

We are also subject to rules, regulations and laws that involve a variety of matters including privacy, data protection and personal information, tax, trade, encryption technology, environmental sustainability (including climate change), human rights, product certification, and national security. Rules governing our use of personal data, such as the General Data Protection Regulation in the European Union, the California Consumer Privacy Act, and other applicable regulations in the United States and around the world continue to evolve and increase, together with current and proposed e-privacy and direct marketing rules governing direct and email marketing. These rules govern how we use personal data of our employees, customers and others with whom we might do business, including in our marketing activities.

A failure, or alleged failure, by us to comply with regulations or laws could have a material adverse effect on our business, operating results, or financial condition. For additional information about government regulation and laws applicable to our business, see “Item 1A. Risk Factors,” including the risk factor entitled “*New regulations or standards or changes in existing regulations or standards in the United States or internationally related to our products may result in unanticipated costs or liabilities, which could have a material adverse effect on our business, results of operations and future sales,*” “*If we fail to comply with environmental requirements, our business, financial condition, operating results and reputation could be adversely affected” and "Our business, operating results and financial condition could be materially harmed by regulatory uncertainty applicable to our products and services.”*

Environmental matters

We are subject to various environmental and other regulations governing product safety, materials usage, packaging and other environmental impacts in the United States and in various countries where our products are manufactured and sold. We are also subject to regulatory developments, including SEC disclosure regulations relating to "conflict minerals," relating to ethically responsible sourcing of the components and materials used in our products. To date, compliance with federal, state, local, and foreign laws enacted for the protection of the environment has had no material effect on our capital expenditures, earnings, or competitive position.

We maintain compliance with various regulations related to the environment, including the Waste Electrical and Electronic Equipment and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment regulations adopted by the European Union. To date, our compliance efforts with various United States and foreign regulations related to the environment has not had a material effect on our operating results.

Human capital management

We pride ourselves on developing and maintaining a strong reputation for innovation and integrity and conduct our business affairs honestly and in an ethical manner. We are proud to be named by Built In Chicago as one of the 100 best large companies to work for in Chicago in 2022. We expect our corporate culture to embody trust and respect for individuals, teamwork and innovation; Cambium is a place where employees are proud to work, and where customers, suppliers and partners want to work with us. One of

our most valuable assets is our integrity. We are guided by our core values of growth and profitability; outstanding global teamwork; relentless innovation and edge; making and meeting commitments; respecting and developing our people; and serving our community.

We are focused on hiring, training, and retaining exceptional talent. As of December 31, 2022, we had approximately 650 full-time employees, of whom 419 are located outside the United States. None of our U.S. employees are subject to a collective bargaining agreement. In certain foreign jurisdictions, where required by local law or custom, some of our employees are represented by local workers' councils and/or industry collective bargaining agreements. We have not experienced any work stoppages, and we consider our relationship with our employees to be good. We have a broad base of diverse talent in more than 20 countries and we believe that attracting, developing and retaining the best talent is critical to our success and achievement of our strategic objectives.

We appreciate one another's differences and strengths and are proud that our workforce comprises employees with a diversity of backgrounds and perspectives. Diversity, inclusion and belonging have long been a part of our culture, and we work to continually expand our diversity, inclusion and belonging initiatives and to conform to the principles of equal opportunity. We do not discriminate based on race, religion, national origin, disability, medical condition, marital status, sex, gender, age, military or veteran status, sexual orientation or any other protected characteristic as established by federal, state or local laws. Further, we have policies in place that prohibit harassment of all kinds and we prohibit retaliation in all forms and are committed to encouraging a culture where employees can freely ask questions and raise concerns.

Although we are working in both remote and hybrid environments as a result of the COVID-19 pandemic, we work collaboratively, without hierarchy, and our management team is readily available to all employees, with additional quarterly global town hall events that allow for open question and answer dialogue.

We offer what we believe is a competitive compensation package, tailored to the job function and geography of each employee. Our team is global, and we offer competitive and meaningful compensation and benefits programs that meet the diverse needs of our employees, while also reflecting local market practices. Our U.S. benefits plan includes health benefits, life and disability insurance, various voluntary insurances, flexible time off and leave programs, an employee assistance plan, an educational assistance policy, and a 401(k) plan with a competitive employer match. Our international benefits plans are competitive locally and generally provide similar benefits. We believe our compensation structure aligns with our shareholders' long-term interests by balancing profitability and growth, as well as current market practices, and reflects our commitment to pay for performance. Competition for qualified personnel in the technology space is intense, and our success depends in large part on our ability to recruit, develop and retain a productive and engaged workforce. Accordingly, investing in our employees and their well-being, offering competitive compensation and benefits, promoting diversity and inclusion, adopting progressive human capital management practices and community outreach constitute core elements of our corporate strategy. In addition to competitive salaries and bonuses or sales commissions, we offer a robust employment total rewards package that promotes employee well-being and includes health care, extended parental leave, and paid time off, including extended leave for new parents (moms, dads and partners) to care for a newborn or newly adopted child.

We also offer rewards and recognition programs to our employees, including peer-led recognition of employees who best exemplify our values. We believe that these recognition programs help drive strong employee performance. We conduct annual employee performance reviews, where each employee is evaluated by their manager as well as a self-assessment. Employee performance is assessed based on a variety of key performance metrics, including the achievement of corporate objectives and objectives specific to the employee's department or role.

We grant equity-based compensation to many of our employees and have extended the opportunity for equity ownership through our employee share purchase plan in the United States, the United Kingdom and India. Additionally, we offer benefits to support our employees' physical and mental health by providing tools and resources to help them improve or maintain their health and encourage healthy behaviors and facilitate a number of employee support groups.

Available information

Our Internet address is www.cambiumnetworks.com and our investor relations website is located at http://investors.cambiumnetworks.com. We make available free of charge on our investor relations website under the sub-heading "Financials" our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports as soon as reasonably practicable after such materials are electronically filed with (or furnished to) the SEC. Information contained on our websites is not incorporated by reference into this Annual Report on Form 10-K. In addition, the public may read and copy materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains an Internet site, www.sec.gov, that includes filings of and information about issuers that file electronically with the SEC.

Item 1A. Risk Factors.

This Report contains forward-looking statements that are subject to risks and uncertainties that could cause actual results to differ materially from those projected. These risks and uncertainties include, but are not limited to, the risk factors set forth below. These risks and uncertainties are not the only ones we face. Our business, financial condition, results of operations or prospects could also be harmed by risks and uncertainties not currently known to us or that we currently do not believe are material. If any of the risks actually occur, our business, financial condition, results of operations and prospects could be adversely affected.

Risks related to our business

Our operating results can be difficult to predict and may fluctuate significantly, which could result in a failure to meet investor expectations or our guidance and a decline in the trading price of our shares.

Our quarterly and annual operating results have fluctuated in the past and may fluctuate significantly in the future. In particular, the timing and size of our sales of our products are difficult to predict and can result in significant fluctuations in our revenues from period to period. For instance, we have historically received and fulfilled a substantial portion of sales orders and generated a substantial portion of revenues during the last few weeks of each quarter. In addition, we generally recognize all product revenues in the same period in which the related products are sold. Because our operating results are relatively fixed in the short term, any failure to meet expectations regarding sales could have an immediate and material effect on our earnings. If our revenues or operating results fall below the expectations of investors or securities analysts or below any estimates we may provide to the market, the trading price of our shares would likely decline, which could have a material and adverse impact on investor confidence and employee retention.

Our operating results may fluctuate due to a variety of factors, many of which are outside of our control, and which we may not foresee. In addition to other risks listed in this "Risks Factors" section, factors that may affect our operating results include:

- Fluctuations in demand for our products, including seasonal variations;
- The impact of COVID-19 and other health crises or pandemics on our operations;
- Our ability to develop, introduce and ship in a timely manner new products and product enhancements, and to anticipate future market demands;
- The impact of component shortages, logistic delays and cost increases on our product manufacturing and shipment operations;
- Our failure to timely fulfill orders for our products, which may be due to a number of factors, including the inability of our third-party manufacturers and suppliers to meet our demand, including as a result of component or part shortages or delays, or logistical failures in warehousing and shipping products;
- Failure of our distributors and channel partners to effectively promote and sell our products or manage their inventory and fulfillment;
- Our ability to control costs, including our manufacturing and component costs and operating expenses;
- Changes in the competitive dynamics of our target markets, including new entrants, consolidation and pricing pressures;
- The inherent complexity, length and associated unpredictability of the sales cycles for our products;
- Announcements made by us or our competitors of new or enhanced products, promotions, changes in standards or other transactions;
- Variation in product costs, prices or mix of products we sell;
- Product quality issues that could result in increases in product warranty costs and harm to our reputation and brand;
- Cyber-attacks, data breaches or malware that may disrupt our operations, harm our operating results and financial condition, and damage our reputation or otherwise materially harm our business;
- The impact of vulnerabilities and critical security defects, prioritization decisions regarding remedying vulnerabilities or security defects, failure of third-party providers to remedy vulnerabilities or security defects, or customers not deploying security releases or deciding not to upgrade products;
- Regulatory uncertainty or changes that may be applicable to or impact our products and services;
- General economic or political conditions or instability in our markets; and
- Increasing uncertainty of and tensions in international trade relations and tariffs.

The effects of these or other factors individually or in combination could result in fluctuations and unpredictability in our operating results, our ability to forecast those results and the trading price of our shares. As a result, our past results should not be relied upon as an indication of our future performance.

The introduction of new products and technology is key to our success, and if we fail to predict and respond to emerging technological trends and network operators' changing needs, we may be unable to remain competitive.

The wireless broadband market is generally characterized by rapidly changing technology, changing needs of network operators, evolving regulations and industry standards and frequent introductions of new products and services. Historically, new product introductions have been a key driver of our revenue growth. To succeed, we must effectively anticipate and adapt in a timely manner to network operator requirements and changing standards and regulatory requirements and continue to develop or acquire new products and features that meet market demands, technology trends and evolving regulatory requirements and industry standards. Our new product development may also be driven by component shortages that may require us to redesign our products. Our ability to keep pace with technological developments, satisfy increasing network operator requirements, and achieve product acceptance depends upon our ability to enhance our current products and develop and introduce or otherwise acquire the rights to new products on a timely basis and at competitive prices. The process of developing new technology is complex and uncertain, and can take time to develop as well as to perfect once released. The development of new products and enhancements typically requires significant upfront investment, which may not result in material improvements to existing products or result in marketable new products or cost savings or revenues for an extended period of time, if at all. Network operators have delayed, and may in the future delay, purchases of our products while awaiting release of new products or product enhancements. In addition, the introduction of new or enhanced products requires that we carefully manage the transition from older products to minimize disruption in channel partner ordering practices. If we fail to anticipate industry trends and evolving regulations by developing or acquiring rights to new products or product enhancements and timely and effectively introducing such new products and enhancements, or network operators do not perceive our products to have compelling technological advantages, our business would be adversely affected.

Terrorism, war, and other events may harm our business, operating results and financial condition.

The continued threat of terrorism and heightened security and military action in response thereto, or any other current or future acts of terrorism, war (such as the on-going Russia and Ukraine war), and other events (such as economic sanctions and trade restrictions, including those related to the on-going Russia and Ukraine war) may cause further disruptions to the economies of the United States and other countries and create further uncertainties or could otherwise negatively impact our business, operating results, and financial condition. The Russia-Ukraine conflict, other areas of geopolitical tension around the world, or the worsening of that conflict or tensions, and the related challenging macroeconomic conditions globally and in various countries in which we and our customers operate may materially adversely affect our customers, vendors, and partners, and the duration and extent to which these factors may impact our future business and operations, results of operations, financial condition, and cash flows remain uncertain. Likewise, events such as loss of infrastructure and utilities services such as energy, transportation, or telecommunications could have similar negative impacts. To the extent that such disruptions or uncertainties result in delays or cancellations of customer orders or the manufacture or shipment of our products, our business, operating results, and financial condition could be materially and adversely affected.

Competitive pressures may harm our business, revenues, growth rates and market share.

The markets for FWB and Enterprise solutions are highly competitive and subject to rapid technological change. We compete in a wide range of related categories, each with its set of competitors worldwide that vary in size and in the products and solutions offered. We expect competition to persist, intensify and increase in the future.

In all our markets, we compete with a number of wireless equipment providers worldwide that vary in size and in the products and solutions offered. Some of the competitors in our markets include the following:

- Our competitors for products and solutions for unlicensed wireless broadband in the sub-7GHz spectrum bands include Ubiquiti, Tarana, Airspan, Radwin, MikroTik, Ligowave, and HFCL Group. Competitors in the 3.5 GHz spectrum band, the Citizens Broadband Radio Service in FCC-governed markets, include Airspan, but also Ericsson, Nokia, Baicells, and Telrad. Our cnWave 60 GHz mmWave point-to-point and point-to-multi-point products compete with Ubiquiti, MikroTik, Siklu, Adtran, and Edgecore.
- Our competitors in the licensed point-to-point microwave market include Aviat Networks, Ceragon, SIAE, NEC, and SAF Technica, among others. Our cnWave 5G fixed (28 GHz) products compete with Intracom, Ericsson, Nokia, and Samsung.
- Our home Wi-Fi routers are offered to subscribers by our fixed wireless service provider customers. These devices compete with all consumer-grade, home Wi-Fi brands.
- Our cnReach narrowband fixed wireless IIoT products and solutions compete principally with GE MDS and Freewave.

- Our enterprise network edge solutions, which include Wi-Fi, cnMatrix ethernet switching, and Network Services Edge (NSE) products compete with a wide range of competitors, in some cases the competitor competing with two or more of our products. Ruckus (CommScope), Ubiquiti, Meraki (Cisco), Extreme Networks, Aruba (HPE), Fortinet, Mist (Juniper), and Ruiji, are competitors to our Wi-Fi Access Point portfolio. Our cnMatrix wireless aware ethernet switch platform competes with Ubiquiti, MikroTik, Cisco, and HPE, among others. Our cnMaestro X network management solution competes with each competitive manufacturers' management platform at a device-level, but also with system-level solutions developed in-house, or commercial solutions.

As our target markets continue to develop and expand, and as the technology for wireless broadband continues to evolve, we expect competition to increase.

Demand for our solutions versus those of our competitors is influenced by a variety of factors, including the following:

- Product quality, performance, features and functionality, and reliability;
- Depth and breadth of the sales channel;
- Brand awareness and reputation;
- Total cost of ownership and return on investment associated with the products;
- Ease of configuration, installation and use of the products;
- Ability to provide a complete compatible and scalable solution;
- Broad application across a range of use cases;
- Ability to allow centralized management of the products and network to better enable network planning, including scalable provisioning, configuration, monitoring and complete network visualization; and
- Strength, quality and scale of pre- and post-sales product support.

We expect increased competition from our current competitors, as well as emerging companies and established companies that may enter our markets. Further, we have in the past and may again experience price competition from lower cost vendors selling to network operators that have lower budget or less demanding applications than our products have been designed to serve. We also expect that even higher cost competitors may engage in price competition to establish greater market share, which may adversely affect our ability to grow our revenues and profitability. Competition could result in loss of market share, increased pricing pressure, reduced profit margins, or increased sales and marketing expense, any of which would likely cause serious harm to our business, operating results or financial condition.

A number of our current or potential competitors have longer operating histories, greater name recognition, significantly larger customer bases and sales channels and significantly greater financial, technical, sales, marketing and other resources than we do. Our competitors may be able to anticipate, influence or adapt more quickly to new or emerging technologies and changes in network operator requirements, devote greater resources to the promotion and sale of their products and services, initiate or withstand substantial price competition, bundle similar products to compete, take advantage of acquisitions or other opportunities more readily, and develop and expand their product and service offerings more quickly than we can.

Some of our competitors have been acquired or entered into partnerships or other strategic relationships to offer a more comprehensive solution than they had previously offered. We expect this trend to continue. The companies resulting from such consolidation may create more compelling products and be able to offer greater pricing flexibility, making it more difficult for us to compete effectively. In addition, continued industry consolidation might adversely affect network operators' perceptions of the viability of smaller and even medium-sized wireless broadband equipment providers and, consequently, their willingness to purchase from those companies.

Additionally, the markets for development, distribution and sale of our products are rapidly evolving. New entrants seeking to gain market share by introducing new technology and new products may make it more difficult for us to sell our products, and could create increased pricing pressure, reduced profit margins due to increased expenditure on sales and marketing, or the loss of market share or expected market share, any of which may significantly harm our business, operating results and financial condition. Competitive pressures may also result from increased political tensions globally, and our ability to manufacture products meeting country of origin or country of manufacture requirements increasingly imposed by countries or end users. We may be unable to easily meet these location of manufacture requirements, which may adversely impact our ability to compete with other competitors who can. The success of new products depends on several factors, including appropriate new product definition, component costs, timely completion and introduction of products, differentiation of new products from those of our competitors and market acceptance of these products. We may not be able to successfully anticipate or adapt to changing technology on a timely basis, or at all. New technologies could render our existing products less attractive and if such technologies are widely adopted as the industry standard for wireless Internet service providers, our business financial condition, results of operations and prospects could be materially adversely affected.

We face risks related to actual or threatened health epidemics and other outbreaks, which could significantly disrupt our manufacturing, sales and other operations.

The global spread of COVID-19 created significant volatility, uncertainty and economic disruption. The restrictions imposed to prevent the spread of COVID-19 disrupted economic activity, resulting in reduced commercial and consumer confidence and spending, increased unemployment, closure or restricted operating conditions for businesses, volatility in the global capital markets, instability in the credit and financial markets, labor shortages, regulatory relief for impacted consumers and disruption in supply chains. While COVID-19 vaccines mitigated mortality risk, new COVID-19 variants proved to remain a threat. The lifting of lockdowns in certain areas started a slow economic recovery. The resulting increase in consumer demand has created significant challenges for supply chains as a result of labor and raw material shortages, which could lead to reduced earnings for many industries. In addition, due to the ongoing pandemic and global semiconductor chip shortage, we have experienced disruption and delays in our supply chain and significant price increases with certain of our manufacturing partners, and those disruptions, delays and price increases may continue. For example, in the second half of 2021, our results of operations were negatively impacted by increased expenses resulting from supply chain disruptions. There are also restrictions and delays on logistics, such as air and ocean cargo carriers, as well as increased logistics costs due to limited capacity and high demands for freight forwarders. If our supply chain operations are affected or are curtailed by the outbreak of diseases such as COVID-19, our supply chain, manufacturing and product shipments will be delayed, which could adversely affect our business, operations and customer relationships. We may need to seek alternate sources of supply which may be more expensive, unavailable or may result in delays in shipments to us from our supply chain and subsequently to our customers. Further, if our distributors' or end user customers' businesses are similarly affected, they might delay or reduce purchases from us, which could adversely affect our results of operations.

In addition, freight and logistics constraints caused in part by restrictions imposed by governments to combat the COVID-19 pandemic and additionally due to container and carriage shortages, have resulted in increased costs and constrained available transport, for us and our channel partners, all at a time when global demand has increased. If our supply chain operations continue to be affected or are curtailed by the outbreak of diseases such as COVID-19, our supply chain, manufacturing and product shipments will be delayed, which could adversely affect our business, operations and customer relationships. We have sought and may continue to seek alternate sources of supply which may be more expensive, unavailable or may result in delays in shipments to us and from our supply chain and subsequently to our customers.

Any alterations or modifications that we are required to make as a result of a global pandemic has in the past and may in the future, adversely impact our business, our customers and prospects, or our financial results.

The extent to which a global pandemic will impact our business and financial results will be dependent on future developments such as the length and severity of the crisis, the potential resurgence of COVID-19 or other pandemic and its variants in the future, future government actions in response to the crisis, the acceptance and effectiveness of vaccines to address the pandemic, and the overall impact of the pandemic on the global economy and capital markets, among many other factors, all of which are highly uncertain and unpredictable. There can be no assurance that any global pandemic or other health crisis will not have a material and adverse effect on our business, financial results and financial condition.

We rely on third-party manufacturers, which subjects us to risks of product delivery delays and reduced control over product costs and quality.

We outsource the manufacturing of our products to third-party manufacturers pursuant to which the third parties manufacture and supply our products subject to orders from us often based on our demand forecasts. Our reliance on third-party manufacturers reduces our control over the manufacturing process, including reduced control over quality, product costs and product supply and timing. From time to time, we have experienced and may in the future experience delays in shipments or issues concerning product quality from our third-party manufacturers. If any of our third-party manufacturers suffer interruptions, delays or disruptions in supplying our products, including by natural disasters or work stoppages or capacity constraints, our ability to ship products to distributors and network operators would be delayed. Additionally, if any of our third-party manufacturers experience quality control problems in their manufacturing operations and our products do not meet network operators' requirements, we could be required to cover the repair or replacement of any defective products. These delays or product quality issues could have an immediate and material adverse effect on our ability to fulfill orders and could have a negative impact on our operating results. In addition, such delays or issues with product quality could harm our reputation and our relationship with our channel partners.

Our agreements do not typically obligate our third-party manufacturers to supply products to us in specific quantities or for an extended term, which could result in short notice to us of supply shortages and increases in the prices we are charged for manufacturing services. We believe that our orders may not represent a material portion of the total orders of our primary third-party manufacturers, and, as a result, fulfilling our orders may not be prioritized in the event they are constrained in their abilities or resources to fulfill all of their customer obligations in a timely manner. Although we provide demand forecasts to some of our third-party manufacturers, some of our third-party manufacturers may assess charges, or we may have liabilities for excess inventory if we overestimate our demand, each of which could negatively affect our gross margins. During the normal course of business, in order to manage manufacturing lead times and help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that allow them to procure inventory based upon criteria as defined by us, such as forecasted demand. We may be liable

to purchase excess product or aged material from our suppliers following reasonable mitigation efforts. Conversely, because lead times for required materials and components vary significantly and depend on factors such as the specific supplier, contract terms and the demand for each component at a given time, if we underestimate our requirements, our third-party manufacturer may have inadequate materials and components required to produce our products. This could result in an interruption of the manufacturing of our products, delays in shipments and deferral or loss of revenues. For example, as a result of increased global demand for some components used in our products, particularly semiconductor-related components, foundries have experienced capacity shortages and have responded by allocating existing supply among their customers, including us. This capacity shortage coupled with an increase in demand for our affected products, due in part to a global increase in demand for bandwidth has resulted in supply shortages that have caused increased lead times for some of our products. We may suffer delays introducing new products to the market and in sales of existing products as a result of parts unavailability or shortages, resulting in loss or delay of revenue.

If our third-party manufacturers experience financial, operational, manufacturing capacity or other difficulties, or experience or continue to experience shortages in required components, or if they are otherwise unable or unwilling to continue to manufacture our products in required volumes or at all, our supply may be disrupted, we may be required to seek alternate manufacturers and we may be required to re-design our products. It would be time-consuming and costly, and could be impracticable, to begin to use new manufacturers and designs and such changes could cause significant interruptions in supply and could have an adverse impact on our ability to meet our scheduled product deliveries and may subsequently lead to the loss of sales, delayed revenues or an increase in our costs, which could materially and adversely affect our business and operating results.

We require third-party components, including components from limited or sole source suppliers, to build our products. The unavailability of these components could substantially disrupt our ability to manufacture our products and fulfill sales orders.

We rely on third-party components to build our products, and we generally rely on our third-party manufacturers to obtain the components necessary for the manufacture of our products. We use our forecast of expected demand to determine our material requirements. Lead times for materials and components we order vary significantly, and depend on factors such as the specific supplier, contract terms and demand for a component at a given time. If forecasts exceed orders, we may have excess and/or obsolete inventory, which could have a material adverse effect on our business, operating results and financial condition. If orders exceed forecasts, or available supply, we may have inadequate supplies of certain materials and components, which could have a material adverse effect on our ability to meet customer delivery requirements and to recognize revenue. If we underestimate our requirements or our third-party suppliers are not able to timely deliver components, our third-party manufacturers may have inadequate materials and components required to produce our products. This could result in an interruption in the manufacture of our products, delays in shipments and fulfillment of customer orders, and deferral or loss of revenues. Our third-party manufacturers may not be able to secure sufficient components at reasonable prices or of acceptable quality to build our products in a timely manner, adversely impacting our ability to meet demand for our products. In addition, if our component suppliers cease manufacturing needed components, we could be required to redesign our products to incorporate components from alternative sources or designs, a process which could cause significant delays in the manufacture and delivery of our products. Unpredictable price increases for such components may also occur. The unavailability of these components could substantially disrupt our ability to manufacture our products and fulfill sales orders.

In addition, we currently depend on a limited number of suppliers for several critical components for our products, and in some instances, we use sole or single source suppliers for our components to simplify design and fulfillment logistics. Neither we nor our third-party manufacturers carry substantial inventory of our product components. Many of these components are also widely used in other product types. Shortages are possible and our ability to predict the availability of such components may be limited. In the event of a shortage or supply interruption from our component suppliers, we or our third-party manufacturers may not be able to develop alternate or second sources in a timely manner, on commercially reasonable terms or at all, and the development of alternate sources may be time-consuming, difficult and costly. Any resulting failure or delay in shipping products could result in lost revenues and a material and adverse effect on our operating results. If we are unable to pass component price increases along to our end customers or maintain stable pricing, our gross margins could be adversely affected and our business, financial condition, results of operations and prospects could suffer.

Supply shortages for key components in our products may result in extended lead times or supply changes, which could disrupt or delay our scheduled product deliveries to our end customers and may result in the loss of sales and end customers.

Our ability to manage our supply chain may be adversely affected by factors including shortages of, and extended lead times for, components used to manufacture our products, a reduction or interruption of supply, prioritization of component shipments to other vendors, cessation of manufacturing of such components by our suppliers and geopolitical conditions such as the U.S. trade war with China and the impact of public health epidemics like the COVID-19 pandemic. Insufficient component supply, or any increases in the time required to manufacture our products, have and may continue to lead to inventory shortages that could result in increased customer lead times for our products, delayed revenue or loss of sales opportunities altogether as potential end customers turn to competitors' products that are more readily available. Shortages in the supply of components or other supply disruptions, including, without limitations, due to reductions in supply as a result of COVID-19 or as a result of the current global shortage of chipsets and other semiconductor components, may not be predicted in time to design-in different components or qualify other suppliers.

Qualifying new suppliers to compensate for such shortages may be time-consuming and costly and may increase the likelihood of errors in design or production. Similar delays may occur in the future.

In order to reduce manufacturing lead times and plan for adequate component supply, from time to time, we may issue purchase orders for components and products that are non-cancelable and non-returnable. In addition, we may purchase components and products that have extended lead teams to ensure adequate supply to support long-term customer demand and mitigate the impact of supply disruptions. If we are unable to use all of the components we have purchased, we may have excess inventory or obsolescence, or increased inventory or carrying costs, which could have an adverse impact on our results of operation or financial condition.

Governmental regulations may also impact our ability to procure required components, such as regulations enacted by the U.S. limiting the ability to procure certain components from China. If we are unable to procure required components from sources outside of jurisdictions restricted by government regulation, we may be unable to produce and sell products that we are able to sell to customers in regions subject to such restrictions.

We may face increased costs or other logistics challenges in the shipment of our products, which may increase cost of revenues or result in a delay of shipments to customers.

Logistics challenges have and may continue to impact our operations, as a result of container shortages which have and may continue to lengthen availability of containers and increased carriage costs, resulting in increases in relevant freight costs, all at a time when global demand has increased. Ports have and may continue to experience increasing lead times with delays in the container freight market as port delays, worker shortages and the impact of any global pandemic impact the ability to import and export goods, particularly from China, resulting in an increase in logistics and freight costs. These logistics and freight challenges and increasing costs could have a material adverse effect on our ability to meet customer delivery requirements, result in increased costs and adversely affect our business, financial condition, results of operations and prospects.

We outsource manufacturing to third-party manufacturers operating outside of the U.S., subjecting us to risks of international operations.

Our third-party manufacturers predominantly operate outside of the U.S. causing us to face risks to our business based on changes in tariffs, trade barriers, export regulations, political conditions and contractual restrictions. Products that we have manufactured for us in China, Mexico, and elsewhere may also be subject to any uncertainty of trade relations between such countries and the United States, which could cause the cost of our products manufactured there to rise, or result in our inability to continue to manufacture in such country, resulting in a need to find alternative sources of manufacture, which could result in the delay of manufacture and supply of our products, increase our cost of manufacture, and cause a delay in our shipments to customers and a delay or cancellation of orders. Our future operating results and financial condition could be materially affected to the extent any of these actions occur.

We rely on distributors and value-added resellers for the substantial majority of our sales, and the failure of our channel partners to promote and support sales of our products would materially reduce our expected future revenues.

We rely on channel partners for a substantial majority of our sales and our future success is highly dependent upon establishing and maintaining successful relationships with distributors and other channel partners. Recruiting and retaining qualified channel partners and training them in our technology and products require significant time and resources. Our reliance on channel partners for sales of our products results in limited visibility into demand and channel inventory levels which in turn adversely impacts our ability to accurately forecast our future revenues. By relying on our channel partners, we may have less contact with end users, thereby making it more difficult for us to establish brand awareness, service ongoing network operator requirements and respond to evolving needs for new product functionality.

Sales through distributors have been highly concentrated in a few distributors, with over 41%, 37%, and 29% of our revenues in 2020, 2021 and 2022, respectively, coming from our three largest distributors. In addition, certain of our distributors may rely disproportionately on sales to a small number of end customers. Termination or degradation of a relationship with a major distributor, or of a distributor with its major customer, could result in a temporary or permanent material loss of revenues. We may not be successful in finding other distributors on satisfactory terms, or at all, and our distributors may fail to maintain or replace business with their major customer, either of which could adversely affect our ability to sell in certain geographic markets or to certain network operators, adversely impacting our revenues, cash flow and market share.

We generally do not require minimum purchase commitments from our channel partners, and our agreements do not prohibit our channel partners from offering products or services that compete with ours or from terminating our contract on short notice. Many of our channel partners also sell products from our competitors. Some of our competitors may have stronger relationships with our channel partners than we do and we have limited control, if any, over the sale by our channel partners of our products instead of our competitors' products, or over the extent of the resources devoted to market and support our competitors' products, rather than our products or solutions. Our competitors may be more effective in providing incentives to existing and potential channel partners to favor their products or to prevent or reduce sales of our products. Our failure to establish and maintain successful relationships with our channel partners would materially and adversely affect our business, operating results and financial condition.

Our third-party logistics and warehousing provider may fail to deliver products to our channel partners and network operators in a timely manner, which could harm our reputation and operating results.

We rely on our third-party logistics and warehousing provider, with distribution hubs currently in the United States, the Netherlands and China, to fulfill the majority of our worldwide sales and deliver our products on a timely basis. Any change in the location of our distribution hubs, such as changes in distribution location anticipated to be made by us in 2023, and any delay in delivery of our products to distributors or network operators could create dissatisfaction, harm our reputation, result in the loss of future sales and, in some cases, subject us to penalties. A change in the location of our distribution centers may result in delays in our ability to ship products to customers from such newly established distribution centers, or adversely impact our ability to meet import or export requirements. We rely on our third-party logistics and warehousing provider to accurately segregate and record our inventory for us and to report to us the receipt and shipments of our products. Our third-party logistics and warehousing provider also manages and tracks the delivery of our products from the warehouse and safeguards our inventory, which accounts for a vast majority of our inventory balance. The failure of our third-party logistics and warehousing provider to perform these key tasks sufficiently, or any disruption to its business as a result of restrictions imposed as a result of health crises, natural disasters, work stoppages, cyber attacks or other business disruptions, could disrupt their operations and therefore the shipment of our products to channel partners or end users or cause errors in our recorded inventory or in our customs or other regulatory documentation, any of which could adversely affect our business and operating results.

Our ability to sell our products is highly dependent on the quality of our support and services offerings, and our failure to offer high-quality support and services could have a material adverse effect on our business, operating results and financial condition.

End users of our products rely on our products for critical applications and, as such, high-quality support is critical for the successful marketing and sale of our products. If we or our channel partners do not provide adequate support in deploying our products or in resolving post-deployment issues quickly, our reputation may be harmed and our ability to sell our products could be materially and adversely affected. In addition, our business continues to evolve, as we offer select products only in conjunction with required support or services purchased in addition to product purchases. There can be no assurance that our ability to require purchase of support and services will be successful.

If we or our distributors and channel partners are unable to attract new end users or sell additional products to end users that currently use our products, our revenue growth would be adversely affected, and our revenues could decrease.

To increase our revenues, we depend on the adoption of our solutions by end users that purchase our products through our channel partners. End users typically need to make substantial investments when deploying network infrastructure, which can delay a purchasing decision. Once a network operator has deployed infrastructure for a particular portion of its network, it is often difficult and costly to switch to another vendor's equipment. If we or our channel partners are unable to demonstrate that our products offer significant performance, functionality or cost advantages to the competitor's product, it would be difficult for us to generate sales to that network operator once a competitor's equipment has been deployed.

Our future success also depends significantly on additional purchases of our products by end users that have previously purchased our products. End users may choose not to purchase additional products because of several factors, including dissatisfaction with our products or pricing relative to competitive offerings, reductions in network operators' spending levels or other causes outside of our control. If we are not able to generate repeat purchases from end users, our revenues may grow more slowly than expected or may decline, and our business and operating results would be adversely affected.

Our gross margin varies from period to period and may decline in the future.

Our gross margin varies from period to period, may be difficult to predict and may decline in future periods. Variations in our gross margin are generally driven by shifts in the mix of products we sell, the timing and related cost of fulfilling orders and other factors. In addition, the market for wireless broadband solutions is characterized by rapid innovation and declining average sale prices as products mature in the marketplace. The sales prices and associated gross margin for our products may decline due to change in sales strategy, competitive pricing pressures, demand, promotional discounts and seasonal changes in demand. Larger competitors with more diverse product and service offerings may reduce the price of products or services that compete with ours or may bundle them with other products and services. If we meet such price reductions but do not similarly reduce our product manufacturing costs, our margins would decline. Any decline in our gross margins could have an adverse impact on the trading price of our shares.

Our products are technologically complex and may contain undetected hardware defects or software bugs, which could result in increased warranty claims, increased costs, loss of revenues and harm to our reputation.

Our products are technologically complex and, when deployed, are critical to network operations. Our products rely on our proprietary embedded software, and have in the past contained and may in the future contain undetected errors, bugs or security vulnerabilities, or suffer reliability or quality issues. Some defects in our products may only be discovered after a product has been installed and used by network operators. Any errors, bugs, defects, security vulnerabilities or quality or reliability issues discovered in our products after commercial release could result in increased warranty claims, damage to our reputation and brand, loss of market

shares or loss of revenues, any of which could adversely affect our business, operating results and financial condition. In addition, our products operate in part in outdoor settings and must withstand environmental effects such as severe weather, lightning or other damage. Our products may also contain latent defects and errors from time to time related to embedded third-party components.

We have in the past and may in the future become subject to warranty claims that may require us to make significant expenditures to repair or replace defective products, or redesign our products to eliminate product vulnerabilities. We may in the future also be the subject of product liability claims. Such claims could require a significant amount of time and expense to resolve and defend against and could harm our reputation by calling into question the quality of our products. We also may incur costs and expenses relating to a recall of one or more of our products. The process of identifying recalled products that have been widely distributed may be lengthy and require significant resources and we may incur significant replacement costs, contract damage claims from network operators and harm to our reputation. Additionally, defects and errors may cause our products to be vulnerable to security attacks, cause them to fail to help secure networks or temporarily interrupt network traffic. Although we disclaim responsibility for certain warranty and product liability claims as well as product recalls or security problems, any substantial costs or payments made in connection with warranty and product liability claims, product recalls or security problems could cause our operating results to decline and harm our brand.

If our channel partners do not effectively manage inventory of our products, fail to timely resell our products or overestimate expected future demand, they may reduce purchases in future periods, causing our revenues and operating results to fluctuate or decline.

Our channel partners purchase and maintain inventories of our products to meet future demand and have only limited rights to return the products they have purchased from us. Our channel partners are not generally committed to volume purchases of our products in any period, although some of our products carry minimum order quantities. Accordingly, if our channel partners purchase more product than is required to meet demand in a particular period, causing their inventory levels to grow, they may delay or reduce additional future purchases, causing our quarterly results to fluctuate and adversely impacting our ability to accurately predict future earnings.

If we are not able to effectively forecast demand or manage our inventory, we may be required to record write-downs for excess or obsolete inventory.

We maintain inventory of finished goods and, to a lesser extent, raw materials that we believe are sufficient to allow timely fulfillment of sales, subject to the impact of supply shortages. Growth in our sales and new product launches may require us to build inventory in the future. Higher levels of inventory expose us to a greater risk of carrying excess or obsolete inventory, which may in turn lead to write-downs. We may also record write-downs in connection with the end-of-life for specific products. Decisions to increase or maintain higher inventory levels are typically based upon uncertain forecasts or other assumptions. Because the markets in which we compete are volatile, competitive and subject to rapid technology and price changes, if the assumptions on which we base these decisions turn out to be incorrect, our financial performance could suffer and we could be required to write-off the value of excess products or components inventory. In addition, in order to manage manufacturing lead times and help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that allow them to procure inventory based upon criteria as defined by us, such as forecasted demand. We may be liable to purchase excess product or aged material from our suppliers following reasonable mitigation efforts, resulting in an adverse impact on our cash flows, operating expenses, results of operation and financial condition.

We are exposed to the credit risk of our channel partners, which could result in material losses.

We generate a substantial majority of our revenues through sales to our distributors. Distributors may not have the resources required to meet payment obligations, or may delay payments if their end customers are late making payments. Our exposure to credit risks of our channel partners and their end customers may increase if such entities are adversely affected by global or regional economic conditions. Given the broad geographic coverage of our distributor relationships, we have in the past and may in the future experience difficulties surrounding the collection of payments. Any significant delay or default in the collection of significant accounts receivable could result in the need for us to obtain working capital from other sources and could adversely impact our operating results and financial condition.

If we do not effectively deploy and train our direct sales force, we may be unable to increase sales.

Although we rely on channel partners to fulfill the substantial majority of our sales, our direct sales force plays a critical role driving our sales through direct engagement with network operators. We have invested and will continue to invest substantially in our sales organization. Our sales headcount has grown from 124 as of December 31, 2019 to 134 as of December 31, 2022, as we focus on growing our business, entering new markets and increasing our market share, and we expect to continue to incur significant expenses as we continue to invest in sales and marketing in order to achieve revenue growth. There is significant competition for sales personnel with the skills and technical knowledge that we require. Our ability to achieve significant revenue growth will depend, in large part, on our success in recruiting, training, retaining and integrating sufficient numbers of sales personnel to support our growth, particularly in international markets. New hires require significant training and may take significant time before they achieve full productivity. Our recent hires may not become productive as quickly as we expect, and we may be unable to hire and retain sufficient numbers of qualified individuals needed to increase our sales. If we are unable to hire and train a sufficient number of effective sales personnel, or the sales personnel we hire do not achieve expected levels of productivity, our business, operating results and financial condition could be materially adversely affected.

Our sales cycles can be long and unpredictable and our sales efforts require considerable time and expense. As a result, our sales and revenues are difficult to predict and may vary substantially from period to period.

Our sales efforts involve educating channel partners and network operators about the technical capabilities, applications and benefits of our products. Network operators typically require long sales cycles to select a product supplier and place sales orders. The sale process usually begins with an evaluation, followed by one or more network trials, followed by vendor selection and finally installation, testing and deployment. Network operator purchasing activity depends upon the stage of completion of expanding network infrastructures and the availability of funding, among other factors. We spend substantial time and resources on our sales efforts without any assurance that our efforts will produce any sales. In addition, purchases of our products are frequently subject to budget constraints, multiple approvals, and unplanned administrative, processing and other delays. Moreover, the evolving nature of the market may lead prospective network operators to postpone their purchasing decisions pending resolution of network standards or adoption of technology by others. Network operators may also postpone a purchase decision pending the release of new or enhanced products by us or others. As a result, it is difficult to predict whether a sale will be completed, the particular period in which a sale will be completed or the period in which revenues from a sale will be recognized, resulting in lumpy sales from period to period. Our operating results may therefore vary significantly from quarter to quarter.

A portion of our revenues are generated by sales to government entities, which are subject to a number of challenges and risks.

We derive a portion of our revenues from contracts with government agencies and we believe the success and growth of our business will in part depend on our continued and increasing sales to U.S. and foreign, federal, state and local governmental end customers in the future. However, demand from government agencies is often unpredictable, and we may be unable to maintain or grow our revenues from this market. Sales to government agencies are subject to substantial risks, including but not limited to the following:

- selling to government agencies can be highly competitive, expensive and time-consuming, often requiring significant upfront time and expense without any assurance that such efforts will generate a sale;
- government entities may have statutory, contractual or other legal rights to terminate contracts with our channel partners or us for convenience or due to a default, and any such termination may adversely impact our future business, financial condition, results of operations and prospects;
- U.S. or other government certification requirements applicable to our goods and services may be difficult to meet, require an additional administrative or compliance burden on us not found in our commercial contracts, and if we are unable to meet these certification requirements, our ability to sell into the government sector may be adversely impacted until we have attained required certifications;
- government demand and payment for our services may be adversely impacted by public sector budgetary cycles and funding constraints;
- selling to government entities may require us to comply with various regulations that are not applicable to sales to non-government entities, including regulations that may relate to pricing, classified material and other matters, or requirements regarding the development and maintenance of programs such as small business subcontracting, or compliance with EEOC or environmental requirements. Complying with such regulations may also require us to put in place controls and procedures to monitor compliance with the applicable regulations that may be costly or not possible;
- purchases by the U.S. and other governments may be subject to technological changes including changes in required standards that must be met, that are not required of non-governmental sales;

- the U.S. government may require certain products that it purchases be manufactured in the United States and other relatively high-cost manufacturing locations under Buy American Act or other regulations, and we may not manufacture all products in locations that meet these requirements, which may preclude our ability to sell some products or services; and
- governments may investigate and audit government contractors' administrative and financial processes and compliance with laws and regulations applicable to government contractors, and any unfavorable audit could result in fines, civil or criminal liability, damage to our reputation and suspension or debarment from further government business.

The occurrence of any of the foregoing could cause governments and governmental agencies to delay or refrain from purchasing our products in the future which could materially and adversely affect our operating results.

We generate a significant amount of revenues from sales outside of the United States, and we are therefore subject to a number of risks associated with international sales and operations.

We have extensive international operations and generate a significant amount of revenues from sales to channel partners in Europe, the Middle East and Africa, Asia-Pacific and South America. For example, sales outside of the United States accounted for 49% of our total revenues in 2020, 51% in 2021, and 55% in 2022. We rely on our third-party logistics and warehousing provider, with distribution hubs currently in the United States, the Netherlands and China to fulfill the majority of our worldwide sales and to deliver our products to our customers. We have estimated the geographical distribution of our product revenues based on the ship-to destinations specified by our distributors when placing orders with us. Our ability to grow our business and our future success will depend on our ability to continue to expand our global operations and sales worldwide.

As a result of our international reach, we must hire and train experienced personnel to manage our international operations. If we experience difficulties in recruiting, training, managing and retaining an international staff, and specifically staff related to sales management and sales personnel, we may experience difficulties expanding our sales outside of the United States. If we are not able to maintain these relationships internationally or to recruit additional channel partners, our future international sales could be limited. Business practices in the international markets that we serve may differ from those in the United States and may require us in the future to include terms other than our standard terms in contracts.

Our international sales and operations are subject to a number of risks, including the following:

- fluctuations in currency exchange rates, which could drive fluctuations in our operating expenses;
- required local regulatory certifications in each jurisdiction, which may be delayed for political or other reasons other than product quality or performance;
- requirements or preferences for domestically manufactured products, which could reduce demand for our products or adversely impact our ability to fulfill customer orders;
- differing technical standards, existing or future regulatory and certification requirements and required product features and functionality;
- management communication problems related to entering new markets with different languages, cultures and political systems;
- difficulties in enforcing contracts and collecting accounts receivable, and longer payment cycles, especially in emerging markets;
- heightened risks of unfair or corrupt business practices in certain geographies and of improper or fraudulent sales arrangements that may impact financial results and result in restatements of, and irregularities in, financial statements;
- difficulties and costs of staffing and managing foreign operations;
- the uncertainty of protection of intellectual property rights in some countries;
- potentially adverse tax consequences, including regulatory requirements regarding our ability to repatriate profits to the United Kingdom;
- requirements to comply with foreign privacy, information security, and data protection laws and regulations and the risks and costs of non-compliance;
- added legal compliance obligations and complexity;
- the increased cost of terminating employees in some countries;
- political and economic instability and terrorism; and
- the impact of the spread of any diseases globally that might impact our operations.

These and other factors could harm our ability to generate future international revenues. Expanding our existing international operations and entering into additional international markets will require significant management attention and financial commitments. Our failure to successfully manage our international operations and the associated risks effectively could limit our future growth or materially adversely affect our business, operating results and financial condition.

A substantial portion of our product portfolio relies on the availability of unlicensed RF spectrum and if such spectrum were to become unavailable through overuse or licensing, the performance of our products could suffer and our revenues from their sales could decrease.

A substantial portion of our product portfolio operates in unlicensed RF spectrum, which is used by a wide range of consumer devices and is becoming increasingly crowded. If such spectrum usage continues to increase through the proliferation of consumer electronics and products competitive with ours, the resultant higher levels of noise in the bands of operation our products use could decrease the effectiveness of our products, which could adversely affect our ability to sell our products. Our business could be further harmed if currently unlicensed RF spectrum becomes licensed in the United States or elsewhere. Network operators that use our products may be unable to obtain licenses for RF spectrum. Even if the unlicensed spectrum remains unlicensed, existing and new governmental regulations may require we make changes in our products. For example, to provide products for network operators who utilize unlicensed RF spectrum, we may be required to limit their ability to use our products in licensed or otherwise restricted RF spectrum. The operation of our products by network operators in the United States or elsewhere in a manner not in compliance with local law could result in fines, operational disruption, or harm to our reputation.

The loss of key personnel or an inability to attract, retain and motivate qualified personnel may impair our ability to expand our business.

Our success is substantially dependent upon the continued service and performance of our senior management team and key technical, marketing and production personnel. Our employees, including our senior management team, are generally at-will employees, and therefore may terminate employment with us at any time with no advance notice. The replacement of any members of our senior management team or other key personnel likely would involve significant time and costs and may significantly delay or prevent the achievement of our business objectives.

Our future success also depends, in part, on our ability to continue to attract and retain highly skilled personnel. Competition for highly skilled personnel is frequently intense, particularly for highly skilled research and development personnel. Any failure to successfully attract or retain qualified personnel to fulfill our current or future needs may negatively impact our growth.

We may acquire other businesses which could require significant management attention, disrupt our business, dilute shareholder value and adversely affect our operating results.

To execute on our business strategy, we may acquire or make investments in complementary companies, products or technologies. Our integration of acquired businesses may not be successful and we may not achieve the benefits of the acquisition. We may not be able to find suitable acquisition candidates, and we may not be able to complete such acquisitions on favorable terms, if at all. If we do complete additional acquisitions, we may not ultimately strengthen our competitive position or achieve our goals, and any acquisitions we complete could be viewed negatively by our channel partners, investors and financial analysts. In addition, if we are unsuccessful at integrating such acquisitions, or the technologies associated with such acquisitions, into our company, the revenues and operating results of the combined company could be adversely affected. Any integration process may require significant time and resources, and we may be unable to manage the process successfully. We may not successfully evaluate or utilize the acquired technology or personnel, or accurately forecast the financial impact of an acquisition transaction, including unexpected liability or accounting charges. We may pay cash, incur debt or issue equity securities to pay for any future acquisition, each of which could adversely affect our financial condition or the value of our shares. The sale of equity or issuance of debt to finance any such acquisitions could result in dilution to our shareholders. The incurrence of indebtedness would result in increased fixed obligations and could also include covenants or other restrictions that would impede our ability to manage our operations.

Risks related to our industry

New regulations or standards or changes in existing regulations or standards in the United States or internationally related to our products may result in unanticipated costs or liabilities, which could have a material adverse effect on our business, results of operations and future sales.

Our products are subject to governmental regulations in a variety of jurisdictions. To achieve and maintain market acceptance, our products must comply with these regulations as well as a significant number of industry standards. In the United States, our products must comply with various regulations defined by the Federal Communications Commission, or FCC, Underwriters Laboratories and others. We must also comply with similar international regulations, particularly those issued by the European Telecommunications Standards Institute, or ETSI, as such directives are or may be adopted as regulations by governments in member states. In addition, radio emissions, such as our products, are subject to health and safety regulation in the United States and in other

countries in which we do business, including by the Center for Devices and Radiological Health of the Food and Drug Administration, the Occupational Safety and Health Administration and various state agencies. Member countries of the European Union have enacted similar standards concerning electrical safety and electromagnetic compatibility and emissions, and chemical substances and use standards. As these regulations and standards evolve, and if new regulations or standards are implemented, we could be required to modify our products or develop and support new versions of our products, and our compliance with these regulations and standards may become more burdensome. The failure of our products to comply, or delays in compliance, with the various existing and evolving industry regulations and standards could prevent or delay introduction of our products, which could harm our business. Changes in standards could cause our products to be required to be redesigned in order to meet these changing standards. Foreign regulatory agencies may delay or fail to certify our products for political or other reasons other than product quality or performance. Network operator uncertainty regarding future policies may also affect demand for wireless broadband products, including our products. Our inability to alter our products to address these requirements and any regulatory changes may have a material adverse effect on our business, operating results and financial condition.

In addition, changes in government regulations providing funding for capital investment in new industries, products or services, such as any government funding of products supporting wireline connectivity rather than wireless connectivity, could adversely impact products that are purchased by our customers and adversely impact our business, results of operations and financial condition. Further, government requirements around the world requiring or providing preference to, domestically produced goods may limit our ability to sell our products to customers in such jurisdictions, impacting our ability to grow our sales in such jurisdictions, adversely impacting our revenues, operations and financial condition.

We are subject to governmental export and import controls that could impair our ability to compete in international markets and subject us to liability if we are not in compliance with applicable laws.

Our technology and products are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. customs regulations, the economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, and applicable U.K., EU and Netherlands export and import laws and regulations. Exports, re-exports and transfers of our products and technology must be made in compliance with these laws and regulations. U.S., U.K. and EU export control laws and economic sanctions include a prohibition on the shipment of certain products and technology to embargoed or sanctioned countries, governments and persons. We take precautions to prevent our products and technology from being shipped to, downloaded by or otherwise transferred to applicable sanctions targets, but our products could be shipped to those targets by our channel partners despite such precautions. If our products are shipped to or downloaded by sanctioned targets in the future in violation of applicable export laws, we could be subject to government investigations, penalties and reputational harm. Certain of our products incorporate encryption technology and may be exported, re-exported or transferred only with the required applicable export license from the U.S., U.K., or the EU through an export license exception.

If we fail to comply with applicable export and import regulations, customs and trade regulations, and economic sanctions and other laws, we could be subject to substantial civil and criminal penalties, including fines and incarceration for responsible employees and managers, and the possible loss of export or import privileges as well as harm our reputation and indirectly have a material adverse effect on our business, operating results and financial condition. In addition, if our channel partners fail to comply with applicable export and import regulations, customs regulations, and economic and sanctions and other laws in connection with our products and technology, then we may also be adversely affected, through reputational harm and penalties. Obtaining the necessary export license for a particular sale may be time-consuming, may result in the delay or loss of sales opportunities and approval is not guaranteed.

Any change in export or import, customs or trade and economic sanctions laws, and regulations, shift in the enforcement or scope of existing laws and regulations, or change in the countries, governments, persons or technologies targeted by such laws and regulations, could also result in decreased use of our products, or in our decreased ability to export or sell our products to existing or potential network operators with international operations. Any decreased use of our products or limitation on our ability to export or sell our products could affect our business, financial condition and results of operations.

*We do business in countries with a history of corruption and transact business with foreign governments, which increases the risks associated with our international activitie*s.

We are subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, or the FCPA, the U.K. Bribery Act of 2010, and many other laws around the world that prohibit improper payments or offers or authorization of payments to governments and their employees, officials, and agents and political parties for the purpose of obtaining or retaining business, inducing an individual to not act in good faith, direct business to any person, or secure any advantage. We have operations, deal with and make sales to governmental entities in countries known to experience corruption, particularly certain emerging countries in Asia, Eastern Europe, the Middle East and South America. Our activities in these countries create the risk of illegal or unauthorized payments or offers of payments or other things of value by our employees, consultants or channel partners that could be in violation of applicable anti-corruption laws, including the FCPA. In many foreign countries where we operate, particularly in countries with developing economies, it may be a local custom for businesses to engage in practices that are prohibited by the FCPA or other similar laws and

regulations. Although we have taken actions to discourage and prevent illegal practices including our anti-corruption compliance policies, procedures, training and monitoring, the actions taken to safeguard against illegal practices, and any future improvements in our anti-corruption compliance practices, may not be effective, and our employees, consultants or channel partners may engage in illegal conduct for which we might be held responsible. Violations of anti-corruption laws may result in severe criminal or civil sanctions, including suspension or debarment from government contracting, and we may be subject to other liabilities and significant costs for investigations, litigation and fees, diversion of resources, negative press coverage, or reputational harm, all of which could negatively affect our business, operating results and financial condition. In addition, the failure to create and maintain accurate books and records or the failure to maintain an adequate system of internal accounting controls may subject us to sanctions.

If we fail to comply with environmental requirements, our business, financial condition, operating results and reputation could be adversely affected.

We are subject to various environmental laws and regulations including laws governing the hazardous material content of our products and laws relating to the recycling of electrical and electronic equipment as well as packaging and recycling requirements. The laws and regulations to which we are subject include the European Union's Restriction of Hazardous Substances Directive, or RoHS, and Waste Electrical and Electronic Equipment Directive, or WEEE, as implemented by EU member states. Similar laws and regulations exist or are pending in other regions, including in the United States, and we are, or may in the future be, subject to these laws and regulations.

RoHS restricts the use of certain hazardous materials, including lead, mercury and cadmium, in the manufacture of certain electrical and electronic products, including some of our products. We have incurred, and expect to incur in the future, costs to comply with these laws, including research and development costs, and costs associated with assuring the supply of compliant components. Certain of our products are eligible for an exemption for lead used in network infrastructure equipment. If this exemption is revoked, or if there are other changes to RoHS (or its interpretation) or if similar laws are passed in other jurisdictions, we may be required to reengineer our products to use components compatible with these regulations. This reengineering and component substitution could result in additional costs to us or disrupt our operations or logistics.

WEEE requires producers of electrical and electronic equipment to be responsible for the collection, reuse, recycling and treatment of their products. Currently, our distributors generally take responsibility for this requirement, as they are often the importer of record. However, changes to WEEE and existing or future laws similar to WEEE may require us to incur additional costs in the future.

If we are unable to comply with these or similar laws or regulations, we could incur fines, penalties, restrictions on our ability to manufacture our products or restrictions or limitations on our ability to import or export our products to or from various jurisdictions.

Any failure to comply with current and future environmental laws could result in the incurrence of fines or penalties and could adversely affect the demand for or sales of our products.

If we are not able to satisfy data protection, security, privacy and other government- and industry-specific requirements or regulations, our business, results of operations and financial condition could be harmed.

Personal privacy, data protection, information security and telecommunications-related laws and regulations have been widely adopted in the United States, Europe and in other jurisdictions where we offer our products. The regulatory frameworks for these matters, including privacy, data protection and information security matters, is rapidly evolving and is likely to remain uncertain for the foreseeable future. We expect that there will continue to be new proposed laws, regulations and industry standards concerning privacy, data protection, information security and telecommunications services in the United States, the European Union and other jurisdictions in which we operate or may operate, and it is not known what impact such future laws, regulations and standards may have on our business.

We also expect that existing laws, regulations and standards may be interpreted in new manners in the future. Future laws, regulations, standards and other obligations, and changes in the interpretation of existing laws, regulations, standards and other obligations could require us to modify our products, restrict our business operations, increase our costs and impair our ability to maintain and grow our channel partner base and increase our revenues. The cost of compliance with, and other burdens imposed by new privacy laws may limit the use and adoption of our products and services and could have an adverse impact on our business, results of operations and financial condition.

Although we work to comply with applicable privacy and data security laws and regulations, industry standards, contractual obligations and other legal obligations, those laws, regulations, standards and obligations are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another. As such, we cannot assure ongoing compliance with all such laws, regulations, standards and obligations. Any failure or perceived failure by us to comply with applicable laws, regulations, standards or obligations, or any actual or suspected security incident, whether or not resulting in unauthorized access to, or acquisition, release or transfer of personally identifiable information or other data, may result in governmental enforcement actions and prosecutions, private litigation, fines and penalties or adverse publicity, and could cause channel partners to lose trust in us, which could have an adverse effect on our reputation and business.

Our actual or perceived failure to adequately protect personal data could result in claims of liability against us, damage our reputation or otherwise materially harm of business.

Global privacy and data protection-related laws and regulations are evolving, extensive, and complex. Compliance with these laws and regulations can be difficult and costly. In addition, evolving legal requirements restricting or governing the collection, use, processing, or cross-border transmission of personal data, including for regulation of cloud-based services, could materially affect our customers' ability to use, and our ability to sell, our products and services. The interpretation and application of these laws and regulations in some instances is uncertain, and our legal and regulatory obligations are subject to frequent changes. For example, the European Union's ("EU") General Data Protection Regulation ("EU GDPR") applies to the extent that our activities: (i) are conducted from an 'establishment' in the EU; or (ii) related to products or services offered to individuals in the EU or the monitoring of their behavior. The EU GDPR imposes a range of compliance obligations on controllers regarding the processing of personal data, including among others: (i) accountability and transparency requirements, which require controllers to demonstrate and record compliance with the EU GDPR and to provide more detailed information to data subjects regarding processing; (ii) enhanced requirements for obtaining valid consent; (iii) obligations to consider data protection as any new products or services are developed and to limit the amount of personal data processed; (iv) obligations to comply with data protection rights of data subjects including a right of access to and rectification of personal data, a right to obtain restriction of processing or to object to processing of personal data and a right to ask for a copy of personal data to be provided to a third party in a usable format and erasing personal data in certain circumstances; (v) obligations to implement appropriate technical and organizational security measures to safeguard personal data; and (vi) obligations to report certain personal data breaches to the relevant supervisory authority without undue delay (and no later than 72 hours where feasible) and/or concerned individuals. In the event of non-compliance, the EU GDPR provides for robust regulatory enforcement and fines of up to €20 million or 4% of the annual global revenue, whichever is greater. In addition, the EU GDPR confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies and obtain compensation for damages resulting from violations of the EU GDPR.

European data protection laws, including the EU GDPR, generally also restrict the transfer of personal data from Europe to the US and most other countries that are not recognized as having "adequate" data protection laws, unless the parties to the transfer have implemented specific safeguards to protect the transferred personal data. One of the primary safeguards allowing US companies to import personal data from Europe has historically been certification to the EU-US Privacy Shield framework administered by the US Department of Commerce. However, the Court of Justice of the European Union (CJEU) issued a decision in July 2020 invalidating the EU-US Privacy Shield framework as a data transfer mechanism (*Schrems II*) and imposing further restrictions on the use of standard contractual clauses (SCCs), including a requirement for companies to carry out a transfer privacy impact assessment, which, among other things, assesses laws governing access to personal data in the recipient country and considers whether supplementary measures that provide privacy protections additional to those provided under the SCCs will need to be implemented to ensure an 'essentially equivalent' level of data protection to that afforded in Europe. Following that decision, the Swiss Federal Data Protection and Information Commissioner took a similar view and considered that data transfers based on the Swiss-US Privacy Shield framework are no longer lawful (despite the fact that *Schrems II* is not directly applicable in Switzerland (unless the Swiss based company is subject to the EU GDPR) and the Swiss-US Privacy Shield has not been officially invalidated).

Further, the European Commission published new EU SCCs in June 2022, which place onerous obligations on the contracting parties. At present, there are few, if any, viable alternatives to the SCCs. However, on October 7, 2022, the US President introduced an Executive Order to facilitate a new Trans-Atlantic Data Privacy Framework which will act as a successor to the invalidated Privacy Shield. On December 13, 2022, the European Commission also published its draft adequacy decision to reflect its view that the new executive order and Trans-Atlantic Data Privacy Framework, is able to meet the concerns raised in *Schrems II*. If the draft adequacy decision is approved and implemented, the agreement will facilitate the transatlantic flow of personal data and provide additional safeguards to data transfer mechanisms (including EU SCCs and Binding Corporate Rules) for companies transferring personal data from the EU to the US. However, before parties rely on the new framework, there are still legislative and regulatory steps that must be undertaken both in the US and in the EU. As such, any transfers by us or our third-party vendors, collaborators or others of personal data from Europe to the US or elsewhere may not comply with European data protection laws, may increase our exposure to European data protection laws' heightened sanctions for cross-border data transfer restrictions may restrict our activities in Europe and may limit our ability to collaborate with service providers, contractors and other companies subject to European data protection laws. Loss of our ability to transfer personal data from Europe may also require us to increase our data processing capabilities in those jurisdictions at significant expense.

Following the UK's departure from the EU (Brexit), the EU GDPR's data protection obligations continue to apply to the UK in substantially unvaried form under the so-called "UK GDPR" (i.e., the EU GDPR as it continues to form part of law in the UK by virtue of section 3 of the European Union (Withdrawal) Act 2018, as amended (including by the various Data Protection, Privacy and Electronic Communications (Amendments etc.) (EU Exit) Regulations)). The UK GDPR exists alongside the UK Data Protection Act 2018 that implements certain derogations in the UK GDPR into English law. Under the UK GDPR, companies not established in the UK but that process personal data either in relation to the offering of products or services to individuals in the UK, or to monitor their behavior will be subject to the UK GDPR, the requirements of which are (at this time) largely aligned with those under the EU GDPR. This may lead to similar compliance and operational costs with potential fines of up to £17.5 million or 4% of global turnover. As a result, we are potentially exposed to two parallel data protection regimes, each of which authorizes fines and the potential for

divergent enforcement actions. It should also be noted that the UK Government published its own form of EU SCCs, known as the International Data Transfer Agreement and International Data Transfer Addendum to the new EU SCCs. The UK Information Commissioner's Office (ICO) has also published its version of the transfer impact assessment and revised guidance on international transfers, although entities may choose to adopt either the EU or UK style transfer impact assessment. In terms of international data transfers between the UK and US, it is understood that the UK and the US are negotiating an adequacy agreement.

Regulation of privacy, data protection and data security has also become more stringent in the United States. For example, the California Consumer Privacy Act (CCPA), which took effect on January 1, 2020, gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. The CCPA may increase our compliance costs and potential liability. The CCPA was substantially expanded on January 1, 2023, when the California Privacy Rights Act (CPRA) amendments to the CCPA became fully operative. The CPRA amendments, among other things, gives California residents the ability to limit use of certain sensitive personal information, further restrict the use of cross-contextual advertising, establish restrictions on the retention of personal information, expand the types of data breaches subject to the CCPA's private right of action, provide for increased penalties for CCPA violations concerning California residents under the age of 16, and establish a new California Privacy Protection Agency to implement and enforce the new law. Other states, such as Colorado, Connecticut, Utah, and Virginia, have already passed similar comprehensive privacy laws that have or will also go into effect in 2023, and several more are considering their own versions of privacy legislation, demonstrating a strong trend towards more stringent state privacy, data protection and data security legislation in the U.S., which could increase our potential liability and adversely affect our business where these laws apply to us.

Our actual or perceived failure to comply with applicable laws and regulations or other obligations relating to personal data, or to protect personal data from unauthorized access, use, or other processing, could subject us to liability to our customers, data subjects, suppliers, business partners, employees, and others, give rise to legal and/or regulatory action, could damage our reputation or could otherwise materially harm our business, any of which could have a material adverse effect on our business, operating results, and financial condition.

Risks related to our intellectual property

Cyber-attacks, data breaches or malware may disrupt our operations, harm our operating results and financial condition, and damage our reputation or otherwise materially harm our business; and cyber-attacks or data breaches on our customers' networks, or in cloud-based services provided by or enabled by us, could result in claims of liability against us, damage our reputation or otherwise materially harm our business.

We experience cyber-attacks and other attempts to gain unauthorized access to our systems on a regular basis, and we anticipate continuing to be subject to such attempts. Despite our implementation of security measures, (i) our products and services, and (ii) the servers, data centers, and cloud-based solutions on which our and third-party data is stored, are vulnerable to cyber-attacks, data breaches, malware, and disruptions from unauthorized access, tampering or other theft or misuse, including by employees, malicious actors or inadvertent error. Such events could in the future compromise or disrupt access to or the operation of our products, services, and networks or those of our customers, or result in the information stored on our systems or those of our customers being improperly accessed, processed, disclosed, lost or stolen. We have not to date experienced a material event; however, the occurrence of any such event in the future could subject us to liability to our customers, suppliers, business partners and others, give rise to legal and/or regulatory action, could damage our reputation or otherwise materially harm our business, and could have a material adverse effect on our business, operating results, and financial condition. Efforts to limit the ability of malicious actors to disrupt our operations or undermine our own security efforts may be costly to implement and may not be successful. Breaches of security in our customers' or suppliers' networks, or in cloud-based services provided by or enabled by us, regardless of whether the breach is attributable to a vulnerability in our products or services, could result in claims of liability against us, damage our reputation or otherwise materially harm our business.

Vulnerabilities and critical security defects, prioritization decisions regarding remedying vulnerabilities or security defects, failure of third-party providers to remedy vulnerabilities or security defects, or customers not deploying security releases or deciding not to upgrade products, services or solutions could result in claims of liability against us, damage our reputation, or otherwise materially harm our business.

The products and services we sell to customers, and our cloud-based solutions, inevitably contain vulnerabilities or critical security defects which have not been remedied and cannot be disclosed without compromising security. We also make prioritization decisions in determining which vulnerabilities or security defects to fix and the timing of these fixes. Customers may also delay the deployment or implementation of fixes offered or made available by us. In addition, we rely on third-party providers of software and cloud-based services, and we cannot control the rate at which they remedy vulnerabilities. When customers do not deploy specific releases, or decide not to upgrade to the latest versions of our products, services or cloud-based solutions containing the release, they may be left vulnerable. Vulnerabilities and critical security defects, prioritization errors in remedying vulnerabilities or security defects, failure of third-party

providers to remedy vulnerabilities or security defects, or customers not deploying specific releases or deciding not to upgrade products, services or solutions could result in claims of liability against us, damage our reputation or otherwise materially harm our business.

We rely on the availability of third-party licenses, the loss of which could materially harm our ability to sell our products.

We rely on certain software or other intellectual property licensed from third parties. It may be necessary in the future to seek new licenses or renew existing licenses. There can be no assurance that the necessary licenses would be available on acceptable terms, if at all. If we are unable to maintain these licenses, or obtain licenses to alternative third-party intellectual property, on acceptable terms, we may be precluded from selling our products, may be required to re-design our products to eliminate reliance on such third-party intellectual property or otherwise experience disruption in operating our business. Third parties owning such intellectual property may engage in litigation against us seeking protection of their intellectual property rights, any of which could have a material adverse effect on our business, operating results, and financial condition.

If we are unable to protect our intellectual property rights, our competitive position could be harmed or we may incur significant expenses to enforce our rights.

We protect our proprietary information and technology through license agreements, nondisclosure agreements, noncompetition covenants, and other contractual provisions and agreements, as well as through patent, trademark, copyright and trade secret laws in the United States and similar laws in other countries. These protections may not be available in all jurisdictions and may be inadequate to prevent our competitors or other third-party manufacturers from copying, reverse engineering or otherwise obtaining and using our technology, proprietary rights or products. For example, the laws of certain countries in which our products are manufactured or licensed do not protect our proprietary rights to the same extent as the laws of the United States. In addition, third parties may seek to challenge, invalidate or circumvent our patents, trademarks, copyrights and trade secrets, or applications for any of the foregoing. We have focused patent, trademark, copyright and trade secret protection primarily in the United States and Europe, although we distribute our products globally. As a result, we may not have sufficient protection of our intellectual property in all countries where infringement may occur. There can be no assurance that our competitors will not independently develop technologies that are substantially equivalent or superior to our technology or design around our proprietary rights. In each case, our ability to compete could be significantly impaired. To prevent substantial unauthorized use of our intellectual property rights, it may be necessary to prosecute actions for infringement and/or misappropriation of our proprietary rights against third parties. Any such action could result in significant costs and diversion of our resources and management's attention, and we may not be successful in such action.

Claims by others that we infringe their intellectual property rights could harm our business.

Our industry is characterized by vigorous protection and pursuit of intellectual property rights. A number of companies hold a large number of patents that may cover technology necessary to our products. We have in the past received and expect to continue to receive claims by third parties that we infringe their intellectual property rights.

In addition, we have received correspondence from certain patent holding companies who assert that we infringe certain patents related to wireless communication technologies. A court adjudicating a claim that we infringe these patents may not rule in our favor should these patent holding companies file suit against us. As our business expands, we enter into new technologies, and the number of products and competitors in our market increases, we expect that infringement claims may increase in number and significance. It is not uncommon for suppliers of certain components of our products, such as chipsets, to be involved in intellectual property-related lawsuits by or against third parties. Our key component suppliers are often targets of such assertions, and we may become a target as well. Any claims or proceedings against us, whether meritorious or not, could be time-consuming, result in costly litigation, require significant amounts of management time or result in the diversion of significant operational resources, any of which could materially and adversely affect our business and operating results.

Intellectual property lawsuits are subject to inherent uncertainties due to the complexity of the technical issues involved, and we cannot be certain that we will be successful in defending ourselves against intellectual property claims. In addition, we currently have a limited portfolio of issued patents compared to our larger competitors, and therefore may not be able to effectively utilize our intellectual property portfolio to assert defenses or counterclaims in response to patent infringement claims or litigation brought against us by third parties. Patent holding companies may seek to monetize patents they previously developed, have purchased or otherwise obtained. Many companies, including our competitors, may now, and in the future, have significantly larger and more mature patent portfolios than we have, which they may use to assert claims of infringement, misappropriation and other violations of intellectual property rights against us. In addition, future litigation may involve non-practicing entities or other patent owners who have no relevant products or revenue and against whom our own patents may therefore provide little or no deterrence or protection, and many other potential litigants have the capability to dedicate substantially greater resources than we do to enforce their intellectual property rights and to defend claims that may be brought against them.

A successful claimant could secure a judgment that requires us to pay substantial damages or prevents us from distributing certain products, obtaining the services of certain employees or independent contractors, or performing certain services. In addition, we might be required to seek a license for the use of such intellectual property, which may not be available on commercially acceptable terms or at all. Alternatively, we may be required to develop non-infringing technology, which could require significant

effort and expense and may ultimately not be successful. Any claims or proceedings against us, whether meritorious or not, could be time consuming, result in costly litigation, require significant amounts of management time, result in the diversion of significant operational resources, or require us to enter into royalty or licensing agreements.

Although we may be able to seek indemnification from our component suppliers and certain of our third-party manufacturers who have provided us with design and build services, these third-party manufacturers or component suppliers may contest their obligations to indemnify us, or their available assets or indemnity obligation may not be sufficient to cover our losses.

Our obligations to indemnify our channel partners or end users against intellectual property infringement claims could cause us to incur substantial costs.

We have agreed, and expect to continue to agree, to indemnify our channel partners and network operators for certain intellectual property infringement claims. If intellectual property infringement claims are made against our channel partners or network operators concerning our products, we could be required to indemnify them for losses resulting from such claims or to refund amounts they have paid to us. The maximum potential amount of future payments we could be required to make may be substantial or unlimited and could materially harm our business. We may in the future agree to defend and indemnify our distributors, network operators and other parties, even if we do not believe that we have an obligation to indemnify them or that our services and products infringe the asserted intellectual property rights. Alternatively, we may reject certain of these indemnity demands, which may lead to disputes with a distributor, network operator or other party and may negatively impact our relationships with the party demanding indemnification or result in litigation against us.

If our third-party manufacturers do not respect our intellectual property and trade secrets and produce competitive products using our design, our business would be harmed.

We outsource manufacture, and in some cases hardware or software design, to third-party manufacturers predominantly in Mexico, China, Israel and Taiwan, among other locations, and periodically evaluate manufacturers in other locations. Prosecution of intellectual property infringement and trade secret theft is more difficult in some of these jurisdictions than in the United States. Although our agreements with our third-party manufacturers generally preclude them from misusing our intellectual property and trade secrets, or using our designs to manufacture product for our competitors, we may be unsuccessful in monitoring and enforcing our intellectual property rights and may find counterfeit goods in the market being sold as our products or products similar to ours produced for our competitors using our intellectual property. Although we take steps to stop counterfeits, we may not be successful and network operators who purchase these counterfeit goods may experience product defects or failures, harming our reputation and brand and causing us to lose future sales.

Our operating results may be adversely affected and damage to our reputation may occur due to production and sale of counterfeit versions of our products.

Our products could be subject to efforts by third parties to produce counterfeit versions of our products. If we become the target of the manufacture of counterfeit goods, are unable to block their sale, are unable to detect counterfeit products in customer networks, or are unable to succeed in prosecuting counterfeiters and their distributors, such counterfeit sales, to the extent they replace otherwise legitimate sales, could adversely affect our operating results.

We use open source software in our products that may subject our firmware to general release or require us to re-engineer our products and the firmware contained therein, which may cause harm to our business.

We incorporate open source software into our products. Use and distribution of open source software may entail greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the software code. Some open source licenses contain requirements that we make available source code for modifications or derivative works we create based upon the open source software and that we license such modifications or derivative works under the terms of a particular open source license or other license granting third parties certain rights of further use. If we combine our proprietary firmware or other software with open source software in a certain manner, we could, under certain of the open source licenses, be required to release our proprietary source code publicly or license such source code on unfavorable terms or at no cost. Open source license terms relating to the disclosure of source code in modifications or derivative works to the open source software are often ambiguous and few if any courts in jurisdictions applicable to us have interpreted such terms. As a result, many of the risks associated with usage of open source software cannot be eliminated, and could, if not properly addressed, negatively affect our business.

If we were found to have inappropriately used open source software, we may be required to release our proprietary source code, re-engineer our firmware or other software, discontinue the sale of our products in the event re-engineering cannot be accomplished on a timely basis or take other remedial action that may divert resources away from our development efforts, any of which could adversely increase our expenses and delay our ability to release our products for sale. We could also be subject to similar conditions or restrictions should there be any changes in the licensing terms of the open source software incorporated into our products.

Financial and accounting risks

If we fail to maintain an effective system of internal controls, our ability to produce timely and accurate financial statements or comply with applicable regulations could be impaired.

As a public company, we are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act, and the rules and regulations of Nasdaq. The requirements of these rules and regulations has and will increase our legal, accounting and financial compliance costs, make some activities more difficult, time-consuming and costly and place strain on our personnel, systems and resources.

The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures over financial reporting. We are continuing to develop and refine our disclosure controls, internal control over financial reporting and other procedures, including controls related to revenue and expense recognition, regulatory compliance issues affecting our financial results, litigation and settlements and other matters, that are designed to ensure that information required to be disclosed by us in the reports that we will file with the SEC is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and that information required to be disclosed in reports under the Exchange Act is accumulated and communicated to our principal executive and financial officers.

Our current controls and any new controls we develop may become inadequate because of growth in our business. Further, weaknesses, including material weaknesses, in our internal controls have been discovered in the past and additional weaknesses may be discovered in the future. Any failure to develop or maintain effective controls, or any difficulties encountered in their implementation or improvement, could harm our operating results or cause us to fail to meet our reporting obligations and may result in a restatement of our financial statements for prior periods. Any failure to implement and maintain effective internal controls also could adversely affect the results of periodic management evaluations and annual independent registered public accounting firm attestation reports regarding the effectiveness of our internal control over financial reporting that we will be required to include in our periodic reports we will file with the SEC under Section 404 of the Sarbanes-Oxley Act once we cease to be an emerging growth company. Ineffective disclosure controls and procedures and internal control over financial reporting could also cause investors to lose confidence in our reported financial and other information, which would likely have a negative effect on the market price of our shares.

We have expended and anticipate we will continue to expend significant resources, and we expect to provide significant management oversight, to maintain and improve the effectiveness of our disclosure controls and procedures and internal controls over financial reporting. Any future failure to maintain the adequacy of our internal controls, or consequent inability to produce accurate financial statements on a timely basis, could increase our operating costs and could materially impair our ability to operate our business. If our internal controls are perceived as inadequate or we are unable to produce timely or accurate financial statements, investors may lose confidence in our operating results and our share price could decline. In addition, if we are unable to continue to meet these requirements, we may not be able to remain listed on Nasdaq.

Our independent registered public accounting firm is not required to formally attest to the effectiveness of our internal control over financial reporting until after we are no longer an emerging growth company. At such time, our independent registered public accounting firm may issue a report that is adverse in the event it is not satisfied with the level at which our controls are documented, designed or operating. Any failure to maintain effective disclosure controls and internal control over financial reporting could have a material and adverse effect on our business and operating results and could cause a decline in the price of our shares.

Adverse economic conditions, continuing uncertain economic conditions or reduced information technology and network infrastructure spending may adversely affect our business, financial condition, results of operations and prospects.

Our business depends on the overall demand for wireless network technology and on the economic health and general willingness of our current and prospective end-customers to make those capital commitments necessary to purchase our products. Weak domestic or global economic conditions and continuing economic uncertainty, fear or anticipation of such conditions, a recession, international trade disputes, global pandemics such as the COVID-19 pandemic, or a reduction in information technology and network infrastructure spending even if economic conditions improve, have from time to time contributed, and may continue to contribute, to slowdowns in the markets in which we compete, resulting in reduced demand for our products as a result of constraints in capital spending, longer sales cycles, increased price competition for our products including lower sales prices, risk of excess and obsolete inventories, risk of supply constraints, and higher overhead costs as a percentage of revenue and higher interest expense, which could adversely affect our business, financial condition, results of operations and prospects, higher default rates among our distributors, reduced unit sales and lower or no growth. If the conditions in the U.S. and global economies deteriorate, become uncertain or volatile, our business, operating results and financial condition may be materially adversely affected. Economic weakness, end-customer financial difficulties, limited availability of credit and constrained capital spending have resulted, and may in the future result, in challenging and delayed sales cycles, slower adoption of new technologies and increased price competition, and could negatively impact our ability to forecast future periods, which could result in an inability to satisfy demand for our products and a loss of market share.

In particular, we cannot be assured of the level of spending on wireless network technology, the deterioration of which would have a material adverse effect on our results of operations and growth rates. The purchase of our products or willingness to replace existing infrastructure is discretionary and highly dependent on a perception of continued rapid growth in consumer usage of mobile devices and in many cases involves a significant commitment of capital and other resources. Therefore, weak economic conditions or a reduction in capital spending would likely adversely impact our business, operating results and financial condition. A reduction in spending on wireless network technology could occur or persist even if economic conditions improve.

In addition, if interest rates rise or foreign exchange rates weaken for our international customers, overall demand for our products and services could decline and related capital spending may be reduced. Furthermore, any increase in worldwide commodity prices may result in higher component prices for us and increased shipping costs, both of which may negatively impact our financial results. A downturn or a recession may also significantly affect financing markets, the availability of capital and the terms and conditions of any financing arrangements, including the overall cost of financing as well as the financial health or creditworthiness of our end customers. Circumstances may arise in which we need, or desire, to raise additional capital, and such capital may not be available on commercially reasonable terms, or at all.

Our business depends on the overall demand for information technology, network connectivity and access to data and applications. Weak domestic or global economic conditions and continuing economic uncertainty, fear or anticipation of such conditions, a recession, international trade disputes, global pandemics such as the COVID-19 pandemic, or a reduction in information technology and network infrastructure spending even if economic conditions improve, could adversely affect our business, financial condition, results of operations and prospects in a number of ways, including longer sales cycles, lower prices for our products and services, higher default rates among our distributors, reduced unit sales and lower or no growth.

The global macroeconomic environment could be negatively affected by, among other things, epidemics, instability in global economic markets, increased U.S. trade tariffs and trade disputes between the U.S., China and other countries, inflationary pressures, higher interest rates, instability in the global credit markets, the impact and uncertainty regarding global central bank monetary policy, instability in the geopolitical environment, the Russia-Ukraine conflict, political tensions between Taiwan and China, political demonstrations, and foreign governmental debt concerns which have caused, and are likely to continue to cause, uncertainty and instability in local economies and in global financial markets.

We are exposed to fluctuations in currency exchange rates, which could adversely affect our business, financial condition, results of operations and prospects.

Our sales contracts are primarily denominated in U.S. dollars, and therefore, substantially all of our revenue is not subject to foreign currency risk; however, as a result of the strengthening U.S. dollar, there has been an increase in the cost of our products to our end customers outside of the U.S., which could adversely affect our business, financial condition, results of operations and prospects. In addition, a decrease in the value of the U.S. dollar relative to foreign currencies could increase our product and operating costs in foreign locations. Further, a portion of our operating expenses is incurred outside the U.S., is denominated in foreign currencies and is subject to fluctuations due to changes in foreign currency exchange rates. If we are not able to successfully hedge against the risks associated with the currency fluctuations, our business, financial condition, results of operations and prospects could be adversely affected.

The elimination of LIBOR could adversely affect our business, results of operations or financial condition.

In July 2017, the head of the United Kingdom Financial Conduct Authority (FCA) announced plans to phase out the use of LIBOR by the end of 2021. In March 2021, the FCA confirmed that all LIBOR settings will either cease to be provided by any administrator or no longer be representative immediately after December 31, 2021in the case of the 1-week and 2-month US Dollar LIBOR tenors, and immediately after June 30, 2023 in the case of the remaining US Dollar LIBOR tenors. Although the impact is uncertain at this time, the elimination of LIBOR could have an adverse impact on our business, results of operations, or financial condition. Although our credit facilities with Bank of America contemplates the elimination of LIBOR-indexed loans, we may incur significant expenses to amend our LIBOR-indexed loans, and other applicable financial or contractual obligations, including our credit facilities, to a new reference rate, which may differ significantly from LIBOR. Accordingly, the use of an alternative rate could result in increased costs, including increased interest expense on our credit facilities, and increased borrowing and hedging costs in the future. At this time, no consensus exists as to what rate or rates may become acceptable alternatives to LIBOR and we are unable to predict the effect of any such alternatives on our business, results of operations or financial condition.

Our credit facility contains restrictive financial covenants that may limit our operating flexibility.

Our credit facility contains certain restrictive covenants that either limit our ability to, or require a mandatory prepayment in the event we, among other things, create or assume certain liens; create, incur or assume additional indebtedness, subject to specified permitted debt; make or hold certain investments, subject to certain exceptions; enter into certain mergers, liquidations, consolidations and other fundamental changes, subject to specified exceptions; make certain sales and other disposition of property or assets, including sale and leaseback transactions, subject to certain conditions and exceptions; make certain payments of dividends, share repurchase and other distributions, subject to certain exceptions; and enter into certain transactions with affiliates. We, therefore, may not be able to engage in any of the foregoing transactions unless we obtain the consent of our lenders or prepay certain amounts under the credit facility. The credit facility also contains certain financial covenants and financial reporting requirements. We have in the past, and may in the future, fail to comply with all of the financial or restrictive covenants of our credit facility, requiring a waiver from our lenders. Our obligations under the credit facility are secured by substantially all of our assets. We may not be able to generate or sustain sufficient cash flow or sales to meet the financial covenants or pay the principal and interest under the credit facility, and we may in the future be unable to meet our financial covenants, requiring additional waivers that our lenders may be unwilling to grant. Furthermore, our future working capital, proceeds of borrowings or proceeds of equity financings could be required to be used to repay or refinance the amounts outstanding under the credit facility and, therefore, may be unavailable for other purposes. In the event of a liquidation, our lenders would be repaid all outstanding principal and interest prior to distribution of assets to unsecured creditors, and the holders of our shares would receive a portion of any liquidation proceeds only if all of our creditors, including our lenders, were first repaid in full.

Enhanced United States tax, tariff, import/export restrictions, Chinese regulations or other trade barriers may have a negative effect on global economic conditions, financial markets and our business.

There is currently significant uncertainty about the future relationship between the United States, and various other countries, most significantly China, with respect to trade policies, treaties, tariffs and taxes. The U.S. government has and continues to make significant additional changes in U.S. trade policy and has taken certain actions that could negatively impact U.S. trade. For example, in 2018, the Office of the U.S. Trade Representative (the "USTR") enacted various tariffs of 7.5%, 10%, 15% and 25% on imports into the U.S. from China, including communications equipment products and components manufactured and imported from China. Since then, China has retaliated through various trade related measures including imposing tariffs on imports into China from the United States.

The U.S. government has also enacted controls restricting the ability to send certain products and technology related to semiconductors, semiconductor manufacturing, and supercomputing to China without an export license. These new controls also apply to certain hardware containing these specified integrated circuits. Other foreign governments may in turn impose similar or more restrictive controls. The U.S. government continue to add additional entities, in China and elsewhere, to restricted party lists impacting the ability of U.S. companies to provide items to these entities. These controls or any additional restrictions may impact our ability to export certain products to China, prohibit us from selling our products to certain of our customers or restrict our ability to use certain Integrated Circuits ("ICs") in our products.

It also is possible that the Chinese government will retaliate in ways that could impact our business. Additionally, these restrictions could disrupt the ability of China to produce semiconductors and other electronics and impact our ability to source components from China. These restrictions could impact the cost of components or inputs used to produce our products.

We cannot predict what actions may ultimately be taken with respect to trade relations between the United States and China or other countries, what products may be subject to such actions or what actions may be taken by the other countries in retaliation. If we are unable to obtain or use components for inclusion in our products, if component prices increase significantly or if we are unable to export or sell our products to any of our customers, our business, liquidity, financial condition, and/or results of operations would be materially and adversely affected.

If tariffs, trade restrictions, or trade barriers remain in place or if new tariffs, trade restrictions, or trade barriers are placed on products such as ours by U.S. or foreign governments, especially China, our costs may increase. We believe we can adjust our supply

chain and manufacturing practices to minimize the impact of the tariffs and any impact on the supply chain of components sourced in China, but our efforts may not be successful, there can be no assurance that we will not experience a disruption in our business related to these or other changes in trade practices and the process of changing suppliers in order to mitigate any such tariff costs could be complicated, time-consuming, and costly.

The U.S. tariffs may also cause customers to delay orders as they evaluate where to take delivery of our products in connection with their efforts to mitigate their own tariff exposure. Such delays create forecasting difficulties for us and increase the risk that orders might be canceled or might never be placed. Current or future tariffs imposed by the U.S. may also negatively impact our customers' sales, thereby causing an indirect negative impact on our own sales. Even in the absence of further tariffs, the related uncertainty and the market's fear of an escalating trade war might cause our distributors and customers to place fewer orders for our products, which could have a material adverse effect on our business, liquidity, financial condition, and/or results of operations.

In June 2022, the import restrictions contained in the Uyghur Forced Labor Prevention Act ("UFLPA") became effective. The UFLPA creates a rebuttable presumption that any goods mined, produced or manufactured, wholly or in part in the Xinjiang Uyghur Autonomous Region ("XUAR") of China, or produced by a listed entity, were made with forced labor and would therefore not be entitled to entry at any U.S. port. Importers are required to present clear and convincing evidence that such goods are not made with forced labor. While we do not source items from the XUAR or from listed parties, and we have increased our supply chain diligence, there is risk that our ability to import components and products may be adversely affected by the UFLPA.

Given the relatively fluid regulatory environment in China and the United States and uncertainty how the U.S. government or foreign governments will act with respect to tariffs, international trade agreements and policies, a trade war, further governmental action related to tariffs or international trade policies, or additional tax or other regulatory changes in the future could directly and adversely impact our financial results and results of operations.

We may face exposure to unknown tax liabilities, which could adversely affect our financial condition, cash flows and results of operations.

We are subject to income and non-income based taxes in the United States and in various non-U.S. jurisdictions. We file U.S. federal income tax returns as well as income tax returns in various U.S. state and local jurisdictions and many non-U.S. jurisdictions. The United States, United Kingdom, India, Mexico, and Brazil are the main taxing jurisdictions in which we operate. Significant judgment is required in dealing with uncertainties in the application of complex tax regulations when calculating our worldwide income tax liabilities and other tax liabilities. We are not aware of any uncertain tax positions as specified by Accounting Standards Codification 740, *Income Taxes*. We expect to continue to benefit from our implemented tax positions. We believe that our tax positions comply with applicable tax law and intend to vigorously defend our positions. However, as described below, tax authorities could take differing positions on certain issues.

We may be subject to income tax audits in all the jurisdictions in which we operate. The years open for audit vary depending on the tax jurisdiction. In the United States, we are no longer subject to U.S. federal income tax examinations by tax authorities for years before 2019. In the non-U.S. jurisdictions, the tax returns that are open vary by jurisdiction and are generally for tax years between 2018 through 2022. We routinely assess exposures to any potential issues arising from current or future audits of current and prior years' tax returns. When assessing such potential exposures and where necessary, we provide a reserve to cover any expected loss. To the extent that we establish a reserve, we increase our provision for income taxes. If we ultimately determine that payment of these amounts is unnecessary, we reverse the liability and recognize a tax benefit during the period in which we determine that the liability is no longer necessary. We record an additional charge in our provision for taxes in the period in which we determine that tax liability is greater than the original estimate. If the governing tax authorities have a differing interpretation of the applicable law, a successful challenge of any of our tax positions could adversely affect our financial condition, cash flows and/or results of operations.

Risks related to ownership of our ordinary shares

Because Vector Capital holds a controlling interest in us, the influence of our public shareholders over significant corporate actions will be limited.

Affiliates of Vector Capital directly or indirectly own approximately 53% of our outstanding shares through their ownership of Vector Cambium Holdings (Cayman), L.P., or VCH, L.P. As a result of its controlling interest in us, Vector Capital has the power to:

- control all matters submitted to our shareholders;
- elect our directors; and
- exercise control over our business, policies and affairs.

Vector Capital is not prohibited from selling its interest in us to third parties, and has sold and will continue to periodically sell its interest in us under the current effective shelf registration statements and future registration statements that are filed by us. While Vector Capital continues to own a majority of our outstanding shares, our ability to engage in significant transactions, such as a merger, acquisition or liquidation, is limited without the consent of Vector Capital. Conflicts of interest could arise between us and Vector Capital, and any conflict of interest may be resolved in a manner that does not favor us. Vector Capital may continue to retain control of us for the foreseeable future and may decide not to enter into a transaction in which our shareholders would receive consideration for their shares that is much higher than the cost to them or the then-current market price of those shares. In addition, Vector Capital could elect to sell a controlling interest in us and shareholders may receive less than the then-current fair market value or the price paid for their shares. Any decision regarding their ownership of us that Vector Capital may make at some future time will be in their absolute discretion.

In addition, pursuant to the terms of our Amended and Restated Memorandum and Articles of Association, Vector Capital and its affiliates have the right to, and have no duty to abstain from, exercising its right to engage or invest in the same or similar business as us, and do business with any of our channel partners, distributors, network operators and any other party with which we do business. In the event that any of our directors or officers who is also a director, officer or employee of Vector Capital or its affiliates acquires knowledge of a corporate opportunity or is offered a corporate opportunity, then Vector Capital or its affiliates may pursue or acquire such corporate opportunity without presenting the corporate opportunity to us without liability, and to the maximum extent permitted by applicable law, such relevant director will be deemed to have fully satisfied their fiduciary duty if the knowledge of such corporate opportunity was not acquired solely in such person's capacity as our director or officer and such person acted in good faith.

In addition, pursuant to our Amended and Restated Memorandum and Articles of Association, a director who is in any way interested in a contract or transaction with us will declare the nature of his interest at a meeting of the board of directors. A director may vote in respect of any such contract or transaction notwithstanding that he may be interested therein and if he does so his vote will be counted and he may be counted in the quorum at any meeting of the board of directors at which any such contract or transaction shall come before the meeting of the board of directors for consideration. We have adopted a written audit committee charter, pursuant to which the audit committee must review all related party transactions required to be disclosed in our financial statements and approve any such related party transaction, unless the transaction is approved by another independent committee of our board.

We are a controlled company within the meaning of Nasdaq rules and, as a result, we qualify for and are relying on exemptions from certain corporate governance requirements.

Vector Capital controls a majority of the voting power of our outstanding shares and as a result, we are a controlled company within the meaning of the corporate governance standards of the Nasdaq. Under Nasdaq rules, a controlled company may elect not to comply with certain corporate governance requirements of the Nasdaq, including the requirements that:

- a majority of the board of directors consist of independent directors;
- the nominating and corporate governance committee be composed entirely of independent directors with a written charter addressing the committee's purpose and responsibilities;
- the compensation committee be composed entirely of independent directors with a written charter addressing the committee's purpose and responsibilities; and
- there be an annual performance evaluation of the nominating and corporate governance and compensation committees.

We are utilizing these exemptions, other than the exemption relating to the independence of the board of directors, as our board of directors is now composed of a majority of independent directors. In addition, although we have adopted charters for our audit and compensation committees and intend to conduct annual performance evaluations for these committees, our compensation committee is not composed entirely of independent directors, although all members of our audit committee are independent. Accordingly, shareholders may not have the same protections afforded to shareholders of companies that are subject to all of the corporate governance requirements of Nasdaq.

The price of our shares may be volatile, and shareholders could lose all or part of their investment.

The trading price of our shares may fluctuate substantially. The trading price of our shares will depend on a number of factors, including those described in this "Risk factors" section, many of which are beyond our control and may not be related to our operating performance. These fluctuations could cause shareholders to lose all or part of their investment in our shares since they might be unable to sell their shares at or above the price paid for them. Factors that could cause fluctuations in the trading price of our shares include the following:

- the financial projections we may provide to the public, any changes in those projections or our failure to meet those projections;
- actual or anticipated developments in our business or our competitors' businesses or the competitive landscape generally;
- sales of our shares by us or our shareholders or hedging activities by market participants;
- failure of financial analysts to maintain coverage of us, changes in financial estimates by any analysts who follow our company, or our failure to meet these estimates or the expectations of investors;
- operating performance or stock market valuations of other technology companies generally, or those in our industry in particular;
- announced or completed acquisitions of businesses or technologies by us or our competitors;
- general economic conditions and slow or negative growth of our markets;
- rumors and market speculation involving us or other companies in our industry;
- litigation involving us, our industry or both or investigations by regulators into our operations or those of our competitors;
- developments or disputes concerning our intellectual property or other proprietary rights;
- new laws or regulations or new interpretations of existing laws or regulations applicable to our business;
- changes in accounting standards, policies, guidelines, interpretations or principles;
- any major change in our management; and
- other events or factors, including those resulting from war, incidents of terrorism or responses to these events.

In addition, the stock market in general, and the market for technology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors may seriously affect the market price of our shares, regardless of our actual operating performance. In the past, following periods of volatility in the overall market and the market prices of particular companies' securities, securities class action litigations have often been instituted against these companies. Litigation of this type, if instituted against us, could result in substantial costs and a diversion of our management's attention and resources.

Our memorandum and articles of association contain anti-takeover provisions that could have a material adverse effect on the rights of holders of our shares.

Our Amended and Restated Memorandum and Articles of Association contain provisions to limit the ability of others to acquire control of our company through non-negotiated transactions. These provisions could have the effect of depriving our shareholders of an opportunity to sell their shares at a premium over prevailing market prices by discouraging third parties from seeking to obtain control of our company in a tender offer or similar transaction. For example, our board of directors has the authority to issue undesignated, or "blank-check," preferred shares without shareholder approval. As a result, our board of directors could authorize and issue a series of preferred shares with terms calculated to delay or prevent a change in control of our company or make removal of management more difficult, which may not be in the interests of holders of our ordinary shares. In addition, our board is staggered and divided into three classes, with each class subject to re-election once every three years on a rotating basis, special meeting of shareholders may only be called by a specified group of directors, executives or shareholders and shareholders must comply with advance notice provisions in order to bring business before or nominate directors for election at shareholder meetings. As a result, shareholders would be prevented from electing an entirely new board of directors at any annual meeting and the ability of shareholders to change the membership of a majority of our board of directors may be delayed.

Because we are incorporated under Cayman Islands law, shareholders may face difficulties in protecting their interests, and the ability to protect rights through U.S. courts may be limited.

We are an exempted company incorporated under the laws of the Cayman Islands. Our corporate affairs are governed by our Amended and Restated Memorandum and Articles of Association, the Companies Act (as amended) of the Cayman Islands and the common law of the Cayman Islands. The rights of shareholders to take action against the directors, actions by minority shareholders and the fiduciary responsibilities of our directors to us under Cayman Islands law are governed by the common law of the Cayman Islands and we have adopted an exclusive forum by law that requires certain shareholder litigations regarding such matters to be brought in Cayman Islands Courts. These exclusive forum provisions do not apply to claims under U.S. federal securities laws. The common law of the Cayman Islands is derived in part from comparatively limited judicial precedent in the Cayman Islands as well as from the common law of England, the decisions of whose courts are of persuasive authority, but are not binding, on a court in the Cayman Islands. The rights of our shareholders and the fiduciary responsibilities of our directors under Cayman Islands law are not as clearly established as they would be under statutes or judicial precedent in some jurisdictions in the United States. In particular, the Cayman Islands has a less developed body of securities laws than the United States. Some U.S. states, such as Delaware, have more fully developed and judicially interpreted bodies of corporate law than the Cayman Islands.

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

In addition, the Cayman Islands courts are also unlikely (1) to recognize or enforce against us judgments of courts of the United States based on certain civil liability provisions of U.S. securities laws, or (2) to impose liabilities against us, in original actions brought in the Cayman Islands, based on certain civil liability provisions of U.S. securities laws that are penal in nature. There is no statutory recognition in the Cayman Islands of judgments obtained in the United States, although the courts of the Cayman Islands will in certain circumstances recognize and enforce a foreign judgment of a foreign court of competent jurisdiction without any re-examination of the merits at common law.

As a result of all of the above, our public shareholders may have more difficulty in protecting their interests in the face of actions taken by management, members of the board of directors or large shareholders than they would as shareholders of a public company incorporated in the United States.

We are an emerging growth company, and any decision on our part to comply only with certain reduced disclosure requirements applicable to emerging growth companies could make our shares less attractive to investors.

We are an emerging growth company, as defined in the JOBS Act, and, for as long as we continue to be an emerging growth company, we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies but not to emerging growth companies, including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years following our initial public offering in 2019, although if the market value of our shares that are held by non-affiliates exceeds $700 million as of any June 30 before the conclusion of that five year period, or if we have total annual gross revenues of $1.07 billion or more during any fiscal year before the conclusion of that five year period, we would cease to be an emerging growth company as of the end of the fiscal year in which such threshold is met. In addition, if we issue more than $1 billion in non-convertible debt in a three-year period, we would cease to be an emerging growth company immediately. Investors may find our shares less attractive because we choose to rely on these exemptions. If some investors find our shares less attractive as a result of our choice to reduce our disclosures, there may be a less active trading market for our shares and our share price may be more volatile.

Our directors may have conflicts of interest because of their ownership of equity interests of, and their employment with, our majority shareholders or its affiliates.

Two of our directors hold ownership interests in Vector Capital as well as ownership in and employment positions with its affiliates. Ownership interests in Vector Capital by our directors could create, or appear to create, potential conflicts of interest when our directors are faced with decisions that could have different implications for us and for Vector Capital or its affiliates. Conflicts of interest may not be resolved in our favor.

General risks

If we are unable to manage our growth and expand our operations successfully, our business and operating results will be harmed.

We have expanded our operations significantly since inception and anticipate that further significant geographic and market expansion will be required to achieve our business objectives. The growth and expansion of our geographic sales, expansion of our products and our entry into new industry verticals places a significant strain on our management, operational and financial resources. Any such future growth would also add complexity to and require effective coordination throughout our organization. To manage any future growth effectively, we must continue to improve and expand our information technology and financial infrastructure, our operating and administrative systems and controls, and our ability to manage headcount, capital and processes in an efficient manner. We may not be able to successfully implement improvements to these systems and processes in a timely or efficient manner, which could result in additional operating inefficiencies and could cause our costs to increase more than planned. If we do increase our operating expenses in anticipation of the growth of our business and this growth does not meet our expectations, our operating results may be negatively impacted. If we are unable to manage future expansion, our ability to provide high quality products and services could be harmed, which could damage our reputation and brand and may have a material adverse effect on our business, operating results and financial condition.

Our business is subject to the risks of earthquakes, fire, floods and other catastrophic events, and to interruption by manmade problems such as network security breaches, computer viruses, terrorism and war.

We have substantial operations in Illinois, California, England and India, and our third-party manufacturers are currently predominantly located in Mexico, China, Taiwan and Israel. Operations in some of these areas are susceptible to disruption due to severe weather, seismic activity, political unrest and other factors. For example, a significant natural disaster, such as an earthquake, a fire or a flood, occurring at the facilities of one of our third-party manufacturers could have a material adverse impact on their ability to manufacture and timely deliver our products. Despite the implementation of network security measures, we also may be vulnerable to computer viruses, break-ins and similar disruptions from unauthorized tampering with our solutions. In addition, natural disasters, acts of terrorism or war could cause disruptions in the businesses of our suppliers, manufacturers, network operators or the economy as a whole. To the extent that any such disruptions result in delays or cancellations of orders or impede our ability to timely deliver our products, or the deployment of our products, our business, operating results and financial condition would be adversely affected.

The continued threat of terrorism and heightened security and military action in response thereto, or any other current or future acts of terrorism, war (such as the on-going Russia and Ukraine war), and other events (such as economic sanctions and trade restrictions, including those related to the on-going Russia and Ukraine war) may cause further disruptions to the economies of the United States and other countries and create further uncertainties or could otherwise negatively impact our business, operating results, and financial condition. Likewise, events such as loss of infrastructure and utilities services such as energy, transportation, or telecommunications could have similar negative impacts. To the extent that such disruptions or uncertainties result in delays or cancellations of customer orders or the manufacture or shipment of our products, our business, operating results, and financial condition could be materially and adversely affected.

Our reputation and/or business could be negatively impacted by ESG matters and/or our reporting of such matters.

There is an increasing focus from regulators, certain investors, and other stakeholders concerning environmental, social, and governance (ESG) matters, both in the United States and internationally. ESG-related initiatives, goals, and/or commitments such as those regarding environmental matters, diversity, responsible sourcing and social investments, and other matters, could be difficult to achieve and costly to implement. The achievement of any goals that we may announce may rely on the accuracy of our estimates and assumptions supporting those goals. We could fail to achieve, or be perceived to fail to achieve, ESG-related initiatives, goals or commitments that we might set, and the timing, scope or nature of these initiatives, goals, or commitments, or for any revisions to them may not be acceptable to the Securities Exchange Commission or other regulators or stakeholders, including our shareholders. Our actual or perceived failure to achieve any ESG-related initiatives, goals, or commitments that we make could negatively impact our reputation or otherwise materially harm our business.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

As of December 31, 2022, we occupied approximately 38,000 square feet of office space in Rolling Meadows, Illinois under an operating lease agreement where we have corporate and executive functions, research and development, customer support, operations and administration and finance services. In addition to our headquarters in Rolling Meadows, we lease additional space in the United States, including San Jose, California and Thousand Oaks, California. We also lease office space in various other international geographic locations, including Ashburton, England and Bangalore, India. In addition, we lease sales office space in Miami, Florida, Italy, Dubai, Mexico and Singapore. We believe our facilities are adequate and suitable for our current needs and that should it be needed, suitable additional or alternative space will be available to accommodate our operations.

For additional information regarding obligations under operating leases, see Note 15 - Leases in the Notes to the Consolidated Financial Statements included in Part II, Item 8: “Financial Statements and Supplementary Data” of this Annual Report on Form 10-K.

Item 3. Legal Proceedings.

Third parties may from time to time assert legal claims against us.

Our industry is characterized by vigorous protection and pursuit of intellectual property rights. A number of companies hold a large number of patents that may cover technology necessary to our products. We have in the past received and expect to continue to receive claims by third parties that we infringe their intellectual property rights. In addition, we may be involved, from time to time, in a variety of claims, lawsuits, investigations, and proceedings relating to contractual disputes, intellectual property rights, employment matters, regulatory compliance matters and other litigation matters relating to various claims that arise in the normal course of business. We determine whether an estimated loss from a contingency should be accrued by assessing whether a loss is deemed probable and can be reasonably estimated. We assess our potential liability by analyzing specific litigation and regulatory matters using available information. We develop our views on estimated losses in consultation with inside and outside counsel, which involves a subjective analysis of potential results and outcomes, and following such assessment, record an amount where it is probable that we will incur a loss and where that loss can be reasonably estimated. However, our estimates may be incorrect and we could ultimately incur more or less than the amounts initially recorded. We are not currently aware of any pending or threatened litigation that would have a material adverse effect on our financial statements.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

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

Market information

Our ordinary shares have been listed on the NASDAQ Global Market under the symbol "CMBM" since June 26, 2019.

Holders of record

As of December 31, 2022, there were 142 shareholders of record of our ordinary shares. Because many of our shares are held by brokers and other institutions on behalf of shareholders, we are unable to estimate the total number of shareholders represented by these record holders. The closing price of our ordinary shares on December 30, 2022 was $21.67 per share as reported on the NASDAQ Global Market.

Recent sale of unregistered securities

None.

Use of proceeds from Initial Public Offering of ordinary shares

The offer and sale of all of the shares in our IPO were registered under the Securities Act pursuant to a registration statement on Form S-1 (File No. 333-21789), which was declared effective by the SEC on June 25, 2019. The remainder of the information required by this item regarding the use of our IPO proceeds has been omitted pursuant to SEC rules because such information has not changed since our last periodic report was filed.

Dividend policy

We have not declared or paid dividends on our ordinary shares since our IPO. Neither Cayman Islands law nor our Amended and Restated Memorandum and Articles of Association requires our board of directors to declare dividends on our ordinary shares. Any future determination to declare cash dividends on our ordinary shares will be made at the discretion of our board of directors and will depend on our financial condition, results of operations, capital requirements, general business conditions and other factors that our board of directors may deem relevant. We do not anticipate paying cash dividends on our ordinary shares for the foreseeable future.

Equity compensation plan information

Information regarding the securities authorized for issuance under our equity compensation plans will be included in our Proxy Statement relating to our 2023 annual meeting of Shareholders to be filed with the SEC within 120 days after the end of our fiscal year ended December 31, 2022 and is incorporated herein by reference.

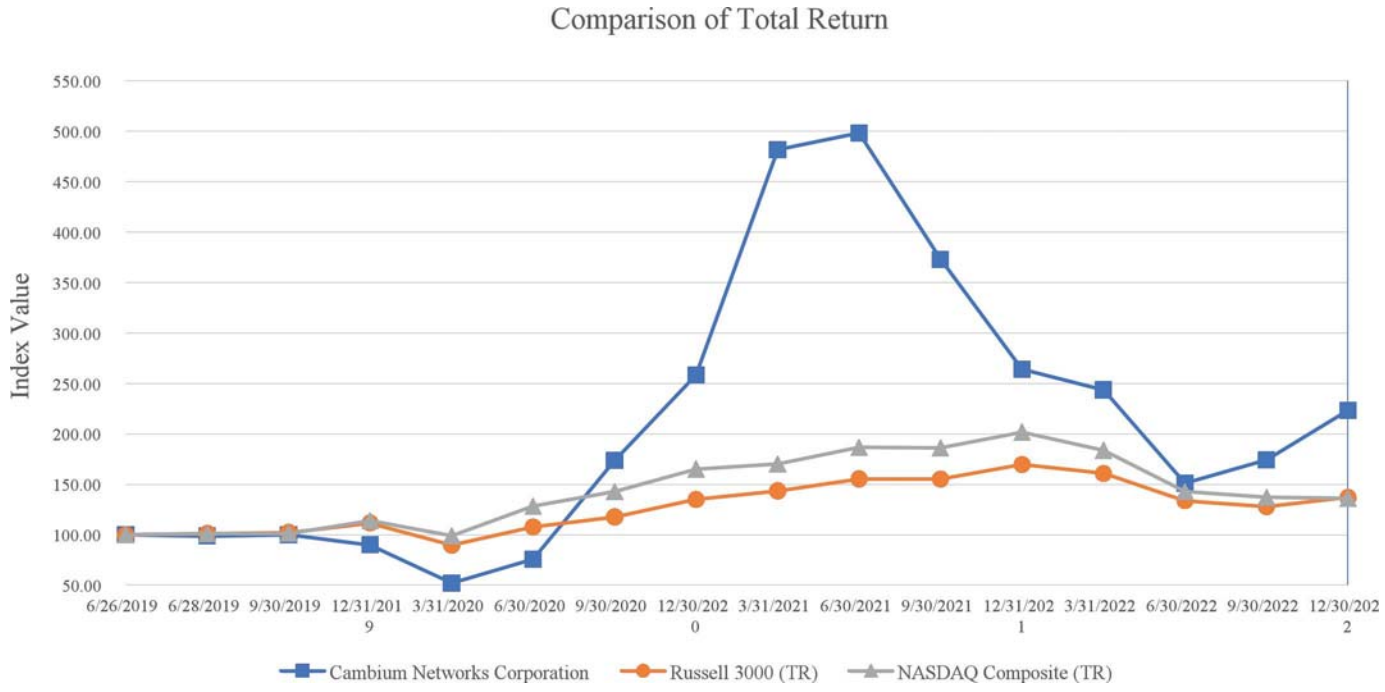
Issuer purchase of equity securities

None.

Performance graph

Notwithstanding any statement to the contrary in any of our filings with the SEC, the following information shall not be deemed "filed" with the SEC or "soliciting material" under the Securities Exchange Act of 1934 and shall not be incorporated by reference into any such filings irrespective of any general incorporation language contained in such filing.

The following graph compares the total cumulative shareholder return on our ordinary shares with the total cumulative return of the Russell 3000 Index and the NASDAQ Composite Index during the period commencing on June 26, 2019, the initial trading day of our ordinary shares, and ending on December 31, 2022. The graph assumes that $100 was invested at the beginning of the period in our ordinary shares and in each of the comparative indices, and the reinvestment of any dividends. Historical share price performance should not be relied upon as an indication of future share price performance.



	6/26/2019	6/28/2019	9/30/2019	12/31/2019	3/31/2020	6/30/2020	9/30/2020	12/30/2020	3/31/2021	6/30/2021	9/30/2021	12/31/2021	3/31/2022	6/30/2022	9/30/2022	12/30/2022
Cambium Networks Corporation	100.00	98.87	100.00	90.10	52.06	75.88	173.92	258.56	481.65	498.45	373.09	264.23	243.71	151.03	174.43	223.40
Russell 3000 (TR)	100.00	101.26	102.44	111.75	89.74	107.87	117.80	135.10	143.67	155.51	155.35	169.77	160.80	133.95	127.97	137.16
NASDAQ Composite (TR)	100.00	101.23	101.41	114.05	99.07	128.50	142.94	165.28	170.16	186.63	186.20	201.94	183.87	142.91	137.32	136.23

Item 6. Reserved.

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

The following discussion and analysis of financial condition and results of operations was prepared to provide the reader with a view and perspective of our business through the eyes of management and should be read in conjunction with the consolidated financial statements and related notes thereto of Cambium Networks Corporation ("Cambium", "we", "our", or "us") included elsewhere in this Annual Report on Form 10-K. The following discussion contains forward-looking statements that reflect our plans, estimates and beliefs. Our actual results could differ materiality from those discussed in the forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this Annual Report on Form 10-K, particularly those discussed under Part I, Item 1A. "Risk Factors." Our historical results are not necessarily indicative of the results that may be expected for any period in the future.

Overview

Cambium Networks is a global technology company that designs, develops, and manufactures wireless broadband and Wi-Fi networking infrastructure solutions for a wide range of applications, including broadband access, wireless backhaul, Industrial Internet of Things (IIoT), public safety communications and Wi-Fi access. Our products are used by businesses, governments, and service providers to build, expand and upgrade broadband networks. Our product lines fall into three broad, interrelated categories: Fixed Wireless Broadband (FWB), Enterprise networking, and Subscription and Services. The FWB portfolio spans point-to-point (PTP) and point-to-multi-point (PMP) architectures over multiple standards, including IEEE 802.11 and 3GPP (Third Generation Partnership Program) and frequency bands, including licensed, unlicensed, and lightly licensed spectrum. The Enterprise portfolio includes Wi-Fi access points, wireless aware switches, and other networking devices.

The Subscription and Services portfolio includes network planning and design as well as cloud or on-premises network management and control. The latter capability, delivered through subscription to cnMaestro™ X, forms the foundation of our ONE Network, a cloud-based network management architecture that allows users to remotely configure, monitor, and manage their wireless network. It provides a single, centralized view of all network devices, including both FWB and Enterprise, as well as real-time performance and usage data, and allows users to make changes to the network configuration and settings. Advanced services offered in conjunction with this platform include application visibility and control which is used to optimize end user experiences; integrated security gateway and SD-WAN for small and medium business; and automated and intelligent network optimization.

Trends impacting our business

Our business and the markets that we serve are experiencing widespread macroeconomic uncertainties, including supply chain constraints, inflation and monetary policy shifts, recession risks, continuation of the COVID-19 pandemic and restrictions on business activities imposed by governments, and potential disruptions from the Russia-Ukraine conflict, the U.S. trade war with China and other global political tensions.

Although we have experienced improvement in our manufacturing and supply chain operations, we continue to experience constraints, with some lingering component shortages, extended lead times, and elevated component and supply chain costs. We continue to work closely with our contract manufacturers and supply chain partners to ramp production following a period of delayed component sourcing and workforce disruptions. We have extended our inventory of certain key components to alleviate component shortages, and extended our demand planning and purchase commitments to alleviate delays in component sourcing and the risk of future supply chain disruptions, but we cannot be certain that such delays or disruptions will not occur, or that our extended demand planning horizon will adequately address these disruptions should they occur. In addition, inflation pressure in our supply chain, scarcity of some materials needed to build our products and disruptions to our manufacturing process have increased our cost of revenue and have impacted, and may continue to negatively impact our gross margin. Our operating cash flows have also been and may continue to be negatively impacted by increased component inventories on hand or at our contract manufacturers, awaiting supply of a limited number of scarce components necessary to build and ship the completed product. While we have increased our inventory of key components, technology shifts could result in this increased inventory becoming excess or obsolete. Although overall demand remains stable, supply chain and manufacturing related constraints could impact our ability to fulfill this demand and as a result could negatively impact our business in future periods. In addition, while we have increased our inventory of key components, technology shifts could cause this increased inventory to become excess or obsolete before it is deployed, as new product development relies on different components.

We continue to monitor the impact of macroeconomic factors, including a potential global recession, inflationary pressures and growing political tensions as a result of the Russia-Ukraine conflict, and political tensions with China and elsewhere. The impact of reverse globalization, including a more nationalistic trend globally leading to increasing government requirements for domestically produced products or limiting the sourcing of components and other products from China and elsewhere, has led us to limit our reliance on third party manufacturers in China and move manufacturing to other locations, which could cause disruptions in our supply operations. In addition, although our business has experienced limited disruption as a result of the Russia-Ukraine conflict, continued escalation of the conflict may negatively impact the global economy and our future operating results and financial condition. We cannot predict the extent that these pressures may have on our financial condition, liquidity, operations, suppliers, industry, and workforce. The extent of the impact of these factors on our operational and financial performance, will depend on future

developments, the impact on our customers, partners, employees, contract manufacturers and supply chain, all of which continue to evolve and are unpredictable. We also believe that any extended or renewed economic disruptions or deterioration in the global economy could have a negative impact on demand from our customers in future periods. Accordingly, current results and financial condition discussed herein may not be indicative of future operating results and trends.

Basis of presentation

Revenues

Our revenues are generated primarily from the sale of our products, which consist of hardware with essential embedded software. Our revenues also include amounts for software products, extended warranty on hardware products and subscription services. We generally recognize product revenues at the time of shipment, provided that all other revenue recognition criteria have been met. Revenues are recognized net of estimated stock returns, volume-based rebates and cooperative marketing allowances that we provide to distributors. We recognize subscription services revenue ratably over the term in which the services are provided and our performance obligation is satisfied. We provide a standard warranty on our hardware products, with the term depending on the product, and record a liability for the estimated future costs associated with potential warranty claims. In addition, we also offer extended warranties for purchase and represents a future performance obligation for us. The extended warranty is included in deferred revenues and is recognized on a straight-line basis over the term of the extended warranty.

Cost of revenues and gross profit

Our cost of revenues is comprised primarily of the costs of procuring finished goods from our third-party manufacturers, third-party logistics and warehousing provider costs, freight costs and warranty costs. We outsource our manufacturing to third-party manufacturers located primarily in Mexico, China, Israel and Taiwan. Cost of revenues also includes costs associated with supply operations, including personnel related and allocated overhead costs, provision for excess and obsolete inventory, third-party license costs and third-party costs related to services we provide. Cost of revenues also includes amortization of capitalized software costs associated with products marketed to be sold.

Gross profit has been and will continue to be affected by various factors, including changes in product mix. The margin profile of products within each of our core product categories can vary significantly depending on the operating performance, features and manufacturer of the product. Generally, our gross margins on backhaul and fixed wireless access point products are greater than those on our CPE products. Because the ratio of CPE to PTP and PMP access points typically increases as network operators build out the density of their networks, increases in follow-on sales to network operators as a percentage of our total sales typically have a downward effect on our overall gross margins. Finally, gross margin will also vary as a function of changes in pricing due to competitive pressure, our third-party manufacturing and other production costs, cost of shipping and logistics, provision for excess and obsolete inventory and other factors. We expect our gross margins will fluctuate from period to period depending on the interplay of these various factors.

Operating expenses

We classify our operating expense as research and development, sales and marketing, and general and administrative expense. Personnel costs are the primary component of each of these operating expense categories, which consist of personnel costs such as salaries, sales commissions, benefits, and bonuses, as well as share-based compensation expense. In addition, we separate depreciation and amortization in their own category.

Research and development

In addition to personnel-related costs, research and development expense consists of costs associated with design and development of our products, product certification, travel, recruiting and shared facility and shared IT costs. We generally recognize research and development expense as incurred. For certain of our software projects under development, we capitalize the development cost during the period between determining technological feasibility of the product and commercial release. We amortize the capitalized development cost upon commercial release, generally over three years and is included in cost of revenues. We typically do not capitalize costs related to the development of first-generation product offerings as technological feasibility generally coincides with general availability of the software.

Sales and marketing

In addition to personnel costs for sales, marketing, service and product line management personnel, sales and marketing expense consists of our training programs, trade shows, marketing programs, promotional materials, demonstration equipment, national and local regulatory approval on our products, travel and entertainment, recruiting and shared facility and shared IT costs.

General and administrative

In addition to personnel costs, general and administrative expense consists of professional fees, such as legal, audit, accounting, information technology and consulting costs, insurance, shared facility and shared IT costs, and other supporting overhead costs.

Depreciation and amortization

Depreciation and amortization expense consist of depreciation related to fixed assets such as computer equipment, furniture and fixtures, and testing equipment, as well as amortization related to acquired and internal use software and definite lived intangibles.

Provision for income taxes

Our provision for income taxes consists primarily of income taxes in the jurisdictions in which we conduct business. Management assesses our deferred tax assets in each reporting period, and if it is determined that it is not more likely than not to be realized, we will record a valuation allowance in that period.

Results of operations

The following table presents the consolidated statements of operations, as well as the percentage relationship to total revenues for items included in our consolidated statements of operations for the year ended December 31, 2021 compared to the year ended December 31, 2022:

(in thousands)	Years ended December 31, 2021	2022
Statements of Operations Data:		
Revenues	$ 335,854	$ 296,899
Cost of revenues	175,058	151,759
Gross profit	160,796	145,140
Operating expenses		
Research and development	51,322	49,865
Sales and marketing	41,819	44,452
General and administrative	25,065	24,982
Depreciation and amortization	6,171	5,961
Total operating expenses	124,377	125,260
Operating income	36,419	19,880
Interest expense, net	4,269	1,977
Other expense (income), net	244	(114)
Income before income taxes	31,906	18,017
Benefit for income taxes	(5,515)	(2,183)
Net income	**$ 37,421**	**$ 20,200**

	Years ended December 31, 2021	2022
Percentage of Revenues:		
Revenues	100.0%	100.0%
Cost of revenues	52.1%	51.1%
Gross margin	47.9%	48.9%
Operating expenses		
Research and development	15.3%	16.8%
Sales and marketing	12.5%	15.0%
General and administrative	7.5%	8.4%
Depreciation and amortization	1.8%	2.0%
Total operating expenses	37.1%	42.2%
Operating income	10.8%	6.7%
Interest expense, net	1.3%	0.7%
Other expense (income), net	0.1%	(0.1)%
Income before income taxes	9.4%	6.1%
Benefit for income taxes	(1.6)%	(0.7)%
Net income	11.0%	6.8%

The following is the discussion and analysis of changes in the financial condition and results of operations for the year ended December 31, 2021 compared to the year ended December 31, 2022. The discussion and analysis of 2020 and changes in the financial condition and results of operations for the year-to-year comparisons between 2020 and 2021 that are not included in this Form 10-K may be found in "Management's Discussion and Analysis of Financial Condition and Results of Operation" in Part II, Item 7 of our Annual report on Form 10-K for the year ended December 31, 2021 filed with the Securities and Exchange Commission ("SEC") on February 24, 2022, which is incorporated by reference to this Part II, Item 7 of this Annual Report on Form 10-K.

Comparison of the year ended December 31, 2021 to the year ended December 31, 2022

Revenues

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Revenues	$ 335,854	$ 296,899	$ (38,955)	(11.6)%

Revenues decreased $39.0 million, or 11.6% from $335.9 million in 2021 to $296.9 million in 2022, which was mostly attributable to decreased demand for our point-to-multi-point products primarily due to lower demand from service providers due to a technology transition along with supply and distribution challenges from China during the first half of 2022. This decrease was partially offset by higher demand for our Enterprise products which benefited from higher volume and pricing of our Wi-Fi 6/6E and switching products and increased demand for our point-to-point products. Although revenue decreased in 2022, we continue to expand our channel, with more than 12,600 total registered channel partners, which includes approximately 160 distributors, as of December 31, 2022.

Revenues by product category

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Point-to-Multi-Point	$ 204,756	$ 114,941	$ (89,815)	(43.9)%
Point-to-Point	60,761	67,083	6,322	10.4%
Enterprise	66,933	109,844	42,911	64.1%
Other	3,404	5,031	1,627	47.8%
Total revenues by product category	$ 335,854	$ 296,899	$ (38,955)	(11.6)%

Point-to-Multi-Point

Our PMP product line comprised 61% of total revenues for 2021 and 39% of total revenues for 2022. PMP revenue decline was driven by slower network buildouts in North America and Europe, Middle East, Africa due to a technology transition to new gigabit technologies within our product portfolio along with supply constraints and distribution challenges during the first half of 2022 which impacted our ability to procure and ship product.

Point-to-Point

PTP revenues increased across all regions, with increased demand from the federal government in North America and defense sector in Europe, Middle East, Africa and increased demand for backhaul products in the other regions.

Enterprise

Enterprise revenues increased 64.1% from 2021 to 2022, and comprised 37% of total revenues for 2022. Our Wi-Fi category has been renamed Enterprise to more accurately describe the products and services being included in this product category. The increase in Enterprise revenues was driven by higher demand for Wi-Fi 6/6E and switching products, with the largest increase in revenues in North America and Europe, Middle East, Africa. Enterprise revenues improved greatly after being negatively impacted in the first half of 2022 due to component shortages and the lockdowns in China impacting our ability to procure and ship product.

Revenues by geography

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
North America	$ 173,491	$ 133,897	$ (39,594)	(22.8)%
Europe, Middle East, Africa	93,082	90,883	(2,199)	(2.4)%
Caribbean and Latin America	40,974	31,223	(9,751)	(23.8)%
Asia Pacific	28,307	40,896	12,589	44.5%
Total revenues by geography	$ 335,854	$ 296,899	$ (38,955)	(11.6)%

Revenues decreased in 2022 compared to 2021 reflecting lower revenues in North America, Europe, Middle East, Africa and Caribbean and Latin America partially offset by higher revenues in Asia Pacific. The decreased revenues in North America was driven mostly by lower revenues for PMP products due to lower demand from service providers along with supply and distribution challenges during the first half of 2022. These decreases were partially offset by higher Enterprise revenues due to higher demand for Wi-Fi 6/6E and switching products along with improved supply. Europe, Middle East, Africa revenues decreased mostly due to lower PMP revenues due to lower demand and technology transition to new gigabit technologies within our product portfolio, partially offset by higher Enterprise revenues due to strong demand and new product introductions for Wi-Fi and switching products and higher PTP revenues due to higher demand from defense business. Caribbean and Latin America revenues decreased due to lower PMP revenues due to lower demand and supply and distribution issues during the first half of 2022 along with lower Enterprise revenues partially offset by higher PTP revenues due to increased demand for backhaul products. The increase in Asia Pacific revenues was driven by higher Enterprise revenues due to improved supply and larger deals along with increased PMP and PTP revenues.

Cost of revenues and gross margin

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Cost of revenues	$ 175,058	$ 151,759	$ (23,299)	(13.3)%
Gross margin	47.9%	48.9%		100 bps

Cost of revenues decreased $23.3 million, or 13.3%, from $175.1 million for 2021 to $151.8 million for 2022. The decrease in cost of revenues was primarily due to decreased revenues, but was impacted by higher production costs during the first half of 2022 due to increase in component charges as a result of component shortages and increases in component costs and in freight and logistics charges as a result of cost increases due to container shortages, use of other distribution, shipment and transportation modes, and increase in costs by logistics and freight providers to meet the high global demand. These impacts were partially offset by price increases and increases in Wi-Fi device and software subscription revenues.

Gross margin increased from 47.9% in 2021 to 48.9% in 2022. The increase reflects price increases introduced in the fourth quarter of 2021 and increased revenue in higher margin products, such as Wi-Fi and software subscriptions partially offset by higher production costs due to increases in component charges as a result of component shortages and increases in component costs, and higher logistics costs to meet demand, including costs of alternative distribution, shipment and transportation modes as a result of government shutdowns in China experienced the first half of 2022.

Operating expenses

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Research and development	$ 51,322	$ 49,865	$ (1,457)	(2.8)%
Sales and marketing	41,819	44,452	2,633	6.3%
General and administrative	25,065	24,982	(83)	(0.3)%
Depreciation and amortization	6,171	5,961	(210)	(3.4)%
Total operating expenses	$ 124,377	$ 125,260	$ 883	0.7%

Research and development

Research and development expense decreased $1.5 million, or 2.8%, from $51.3 million in 2021 to $49.9 million in 2022. As a percentage of revenues, research and development expenses increased from 15.3% in 2021 to 16.8% in 2022. Research and development expense decreased mainly due to a $4.7 million decrease in corporate bonus expense due to lower financial performance along with $0.3 million higher capitalized software costs due to increase in projects eligible for capitalization and $0.2 million lower engineering project material costs. These decreases were mostly offset by $1.5 million in higher share-based compensation expense due to new grants issued, $1.0 million higher staffing-related expenses due to increased headcount, $0.8 million higher contractor costs due to increases in the number of contractors to support ramping of projects, $0.2 million higher travel-related costs and $0.2 million higher homologation and regulatory testing expense due to increase in new product introductions.

Sales and marketing

Sales and marketing expense increased $2.6 million, or 6.3%, from $41.8 million in 2021 to $44.5 million in 2022. As a percentage of revenues, sales and marketing expense increased from 12.5% in 2021 to 15.0% in 2022. The increase in sales and marketing expense was primarily due to $1.2 million in higher travel-related spend and $0.4 million higher trade show and marketing-related spend as restrictions on travel and conferences imposed by COVID-19 pandemic continue to lessen in parts of the world, $1.1 million higher payroll-related costs, along with $0.7 million higher share-based compensation expense due to new grants issued and $0.2 million of severance. The remainder of the increase is driven by $0.4 million higher homologation and regulatory testing expense

and $0.1 million higher software subscription fees. These increases were partially offset by $1.5 million lower corporate bonus expense due to lower financial performance.

General and administrative

General and administrative expense decreased $0.1 million, or 0.3%, from $25.1 million in 2021 to $25.0 million in 2022. As a percentage of revenues, general and administrative expense increased from 7.5% in 2021 to 8.4% in 2022. The decrease in general and administrative expense was primarily due to $2.3 million lower corporate bonus expense due to lower financial performance and $0.3 million lower insurance expense. These decreases were mostly offset by $0.7 million higher payroll-related costs, mostly driven by $0.2 million nonrecurring severance recognized in the second quarter of 2022, along with $0.7 million higher share-based compensation expense due to new grants issued. The remainder of the offset was driven by $0.6 million higher professional service fees, $0.2 million higher business tax expense, $0.2 million higher travel-related spend and $0.2 million higher IT expense, mostly for subscription licenses.

Depreciation and amortization

Depreciation and amortization expense decreased $0.2 million, or 3.4%, from $6.2 million in 2021 to $6.0 million in 2022. The decrease in depreciation and amortization was mostly driven by the amortization of finite-lived intangibles being fully depreciated in the fourth quarter of 2021 offset by slightly higher depreciation on new assets placed in service.

Interest expense, net

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Interest expense, net	$ 4,269	$ 1,977	$ (2,292)	(53.7)%

Interest expense decreased $2.3 million, or 53.7% from $4.3 million in 2021 to $2.0 million in 2022. The decrease was primarily due to a reduction in the interest rate, lower principal balance on the term loan and lower amortization of deferred financing fees, mostly due to additional amortization recognized in 2021 related to write-offs of deferred financing fees associated with the extinguishment of the Silicon Valley Bank term loan.

Other expense (income), net

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Other expense (income), net	$ 244	$ (114)	$ (358)	(146.7)%

Other expense (income), net changed from expense of $0.3 million in 2021 to income of $0.1 million in 2022. The change is primarily associated with foreign currency fluctuations.

Benefit for income taxes

	Years ended December 31,		Change	
(dollars in thousands)	2021	2022	$	%
Benefit for income taxes	$ (5,515)	$ (2,183)	$ 3,332	(60.4)%
Effective income tax rate	(17.3)%	(12.1)%		

Our tax benefit decreased from a tax benefit of ($5.5) million in 2021 to a tax benefit of ($2.2) million for 2022. The effective tax rates for the years ended December 31, 2021 and 2022 were (17.3)% and (12.1)%, respectively. For the year ended December 31, 2022, our income tax benefit decreased by $3.3 million from the year ended December 31, 2021 primarily due a change in the valuation allowance of $8.8 million as a result of the recognition of a valuation allowance of $0.9 million on California deferred tax assets on research and development during 2022 versus a release of the valuation allowance on UK deferred tax assets in 2021 of $7.9 million and a decrease in tax benefits on share-based compensation of $2.6 million offset by an increase in the benefit on Foreign Derived Intangible Income of $2.3 million, an increase in research and development tax credits in the UK, U.S., and U.S. states of $2.0 million and a tax benefit of $0.9 million on revaluation of the UK deferred tax assets at a higher rate. For the year ended December 31, 2021, the Company's effective tax rate of (17.3)% differed from the U.S. statutory rate of 21.0% primarily due to a tax benefit on the release of a valuation allowance against our UK deferred tax assets of $7.9 million and a $3.4 million tax benefit arising on employee restricted share vesting and option exercises. For the year ended December 31, 2022, the Company's effective tax rate of (12.1)% differed from the U.S. statutory rate of 21.0% primarily due to research and development tax credits of $2.8 million, a benefit on Foreign Derived Intangible Income of $2.3 million, and a tax benefit of $0.9 million on revaluation of the UK deferred tax assets at

a higher tax rate. See Note 12 - Income taxes in the Notes to the Consolidated Financial Statements for more information related to income taxes.

Liquidity and Capital Resources

As of December 31, 2022, we had a cash balance of $48.2 million. Our financial condition and liquidity remain strong. We assess our liquidity in terms of our ability to generate adequate cash to fund our operating, investing and financing activities. We believe our existing cash, operating cash flow and revolving credit facilities provide us with the financial flexibility needed to fund normal operating expenses, to meet interest and principal requirements of our outstanding indebtedness, and fund capital expenditures. We believe these needs will be satisfied over at least the next 12 months. Our future capital requirements may vary materially from those currently planned and will depend on many factors, including our rate of revenue growth, the timing and extent of spending to support development efforts, the timing of new product introductions, market acceptance of our products and overall economic conditions. We expect to regularly assess market conditions and may raise additional equity or incur additional debt if and when management, along with our board of directors, determines that doing so is in our best interest.

We refinanced our credit facilities on November 17, 2021 by establishing a new credit facility with Bank of America and extinguishing our existing credit facility with Silicon Valley Bank. The new credit facility with Bank of America allows for total borrowings of $75.0 million, which includes a $30.0 million term loan and a revolving loan of $45.0 million. On November 17, 2021, we borrowed the entire $30.0 million term loan, which was used to pay off the term loan with Silicon Valley Bank. As of December 31, 2022, we had $28.0 million outstanding principal debt on our term loan, including the current portion of $3.3 million. As of December 31, 2022, we had $45.0 million available under our revolving commitments, with no amounts drawn thereunder. In accordance with the terms of our credit facility with Bank of America, we began making quarterly principal payments of approximately $0.7 million on our term loan, commencing with the quarter ended March 31, 2022.

Cash Flows

The following table sets forth summarized cash flow data for the periods indicated (in thousands):

	Years Ended December 31,	
	2021	2022
Cash provided by (used in) operating activities	$ 29,960	$ (3,054)
Cash used in investing activities	$ (10,166)	$ (9,245)
Cash (used in) provided by financing activities	$ (22,953)	$ 1,245

Cash flows from operating activities

Net cash provided by operating activities for 2021 of $30.0 million consisted primarily of net income of $37.4 million, adjustments for depreciation and amortization of $8.1 million, share-based compensation expense of $7.7 million, and an increase in deferred income taxes of $6.1 million along with changes in operating assets and liabilities that resulted in net cash outflows of $17.0 million. The changes in operating assets and liabilities consisted primarily of a $11.2 million increase in accounts receivable due to higher sales in the last month of the quarter, along with $8.0 million increase in prepaid assets due to prepayments made to suppliers to procure inventory and $2.7 million decrease in accounts payable due to timing of purchases and payments, offset by $2.5 million increase in accrued liabilities, and a $1.9 million increase in accrued employee compensation related to higher bonus due to increased headcount and salaries.

Net cash used in operating activities for 2022 of $3.1 million consisted primarily of net income of $20.2 million, adjustments for depreciation and amortization of $7.9 million, share-based compensation expense of $10.7 million and increase in provision for inventory excess and obsolescence of $3.7 million offset by a $5.2 million increase in deferred income taxes along with changes in operating assets and liabilities that resulted in net cash outflows of $40.3 million. The changes in operating assets and liabilities consisted primarily of a $27.0 million increase in inventories due to management's plan to build inventory in response to supply chain constraints, $12.9 million increase in accounts receivable reflecting higher sales and the timing of collections, and $8.9 million decrease in accrued employee compensation primarily due to the payment of the 2021 corporate bonus net of the 2022 corporate bonus accrual offset by $8.5 million increase in cash provided by all other assets and liabilities, mostly driven by the $5.3 million increase in deferred revenues and $2.8 million increase in accounts payable due to the timing of purchases and payments.

Cash flows from investing activities

Our investing activities for both periods presented consisted of capital expenditures for property, equipment and software in support of the growth of our business.

Cash flows from financing activities

Net cash used in financing activities of $23.0 million for 2021 was primarily due to payment of $55.3 million on our existing term loan, $2.8 million of taxes paid on net share settlement of equity awards and a $1.2 million payment of debt issuance costs incurred with our new credit facility. These outflows are partially offset by $29.8 million in proceeds received under our new credit facility, $4.8 million in proceeds from the exercise of share options and $1.8 million in proceeds from the issuance of ordinary shares under our employee share purchase program.

Net cash provided by financing activities of $1.2 million for 2022 was primarily due to $2.2 million in proceeds received from the exercise of share options and $2.0 million in proceeds received from the issuance of ordinary shares under our employee share purchase program offset by $2.0 million repayment of principal due under the term loan facility and $1.0 million for taxes paid from shares withheld in net settlement of taxes due on vesting of restricted shares issued to our employees.

Debt

We refinanced our credit facilities on November 17, 2021, by establishing a new credit facility with Bank of America ("BofA Credit Agreement") and extinguishing our existing credit facility with Silicon Valley Bank. The BofA Credit Agreement allows for total borrowings of $75.0 million, which includes a $30.0 million term loan and a revolving loan of $45.0 million. On November 17, 2021, we borrowed the entire $30.0 million term loan, which was used to pay off the term loan with Silicon Valley Bank. As of December 31, 2022, we had $28.0 million outstanding principal debt on our term loan, including the current portion of $3.3 million. As of December 31, 2022, the Company had $45.0 million available under the revolving commitments, with no amounts drawn thereunder.

In accordance with the terms of the BofA Credit Agreement, commencing with the quarter ended March 31, 2022, we began paying quarterly principal payments of approximately $0.7 million on our term loan. The BofA Credit Agreement contains (i) customary representations, warranties and affirmative and negative covenants, (ii) a maximum consolidated leverage ratio and (iii) a minimum consolidated fixed charge coverage ratio. As of December 31, 2022, we were in compliance with such affirmative and negative covenants, our consolidated leverage ratio and our consolidated fixed charge coverage ratio.

Summary of contractual obligations

We lease office space and equipment under operating leases that run through 2026. Additionally, our BofA Credit Agreement matures and becomes due and payable in November 2026.

A summary of our contractual obligations at December 31, 2022 are as follows (in thousands):

	Payments due by period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
Operating lease obligations [1]	$ 2,154	$ 1,922	$ 384	$ —	$ 4,460
Term credit facility [2]	3,281	24,750	—	—	28,031
Term credit facility interest [2]	1,716	3,978	—	—	5,694
Purchase obligations [3]	84,978	180	—	—	85,158
Total	$ 92,129	$ 30,830	$ 384	$ —	$ 123,343

(1) These amounts represent the undiscounted non-cancelable remaining lease payments. For a detailed discussion on our operating leases, refer to Note 15, Leases, in Notes to Consolidated Financial Statements in Item 8 of part II of this Annual Report on Form 10-K.

(2) These amounts represent the scheduled principal payments based on their contractual maturities related to our term loan with Bank of America and interest payments based on the interest rate in effect on December 31, 2022 of 6.40%. For a detailed discussion of our credit facilities, refer to Note 6, Debt, in Notes to Consolidated Financial Statements in Item 8 of Part II of this Annual Report on Form 10-K.

(3) These amounts represents unrecorded open purchase orders at December 31, 2022, primarily for inventory-related purchase orders with suppliers.

Commitments for purchase obligations has increased from 2021 due to planned revenue growth and the impact from extended lead times we are experiencing with our suppliers. In addition to the contractual obligations noted above, we expect to increase our year over year spend for capital expenditures driven by an expansion in our research and development labs and software costs in connection with new products. We believe that cash generated from operations, together with existing sources of liquidity, will satisfy the cash requirements for these contractual obligations.

Critical accounting policies and estimates

Our consolidated financial statements are prepared in accordance with U.S. GAAP. The preparation of these financial statements requires our management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, costs and expense and related disclosures. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these judgments and estimates under different assumptions or conditions and any such differences may be material. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates. For a summary of all of our accounting policies, including the accounting policies discussed below, see Note 1, *Description of Business and Summary of Significant Accounting Policies*, in the Notes to Consolidated Financial Statements.

Recognition of revenues

Our revenues are generated primarily from the sale of hardware products, with essential embedded software. Our revenues also include limited amounts for software products, extended warranty on hardware products and subscription services. Revenue is recognized upon transfer of control of promised products to customers in an amount that reflects the consideration we expect to receive in exchange for those products. We generally recognize product revenues at the time of shipment, provided that all other revenue recognition criteria have been met. Revenues are recognized net of estimated stock returns, volume-based rebates and cooperative marketing allowances that we provide to distributors. Estimated stock returns, volume-based rebates and cooperative marketing allowances are based on historical experience together with any known future business trends. The assumptions used to derive these estimates did not change significantly in the current period, nor did the value of each estimate. We recognize revenues on extended warranty on a straight-line basis over the term of the extended warranty. We recognize subscription services revenue ratably over the term in which the services are provided and our performance obligation is satisfied. We determine the appropriate revenue recognition for our contracts with customers by analyzing the type, terms and conditions of each contract or arrangement. Certain of our contracts have multiple performance obligations for which we allocate the transaction price to each performance obligation based on the standalone selling price of each distinct product or service in the contract. The standalone selling price is the price at which we expect to be entitled to in exchange for transferring the promised good or service to the customer. The best evidence of standalone selling price is the observable price of a product or service when the Company sells that product or service separately in similar circumstances and to similar customers. In certain cases, the standalone sales price is not directly observable, and we estimate the transaction price allocated to each performance obligation using the expected cost plus margin approach. When, or as, a performance obligation is satisfied, we recognize as revenue the amount of the transaction price that is allocated to that performance obligation. The transaction price recognized excludes an estimate for the consideration related to products we expect to be returned or amounts we expect to refund.

Inventory and inventory valuation

Inventories are stated at the lower of cost or net realizable value. In determining the cost of raw materials, consumables and goods purchased for resale, the weighted average purchase price is used. For finished goods, cost is computed as production cost including capitalized inbound freight costs.

The valuation of inventory requires us to estimate excess or obsolete inventory. The determination of excess or obsolete inventory is estimated based on a comparison of the quantity and cost of inventory on hand to our forecast of customer demand and in consideration of historical usage and management judgment. The assumptions used to derive this estimate did not change significantly in the current period. The actual amount of inventory written off in future periods will likely differ from the inventory excess and obsolete provisions reflected in our consolidated balance sheets due to difference between estimated and actual future demand, which could have a material effect on our net inventory as reported in our consolidated financial statements. Any adjustments to the valuation of inventory are included in cost of revenues.

Product warranties

We provide a standard warranty on our products, with the term depending on the product, and record a liability for the estimated future costs associated with potential warranty claims at the time products are sold. Our responsibility under our standard warranty is the repair or replacement of in-warranty defective product, or to credit the purchase price of the defective product, at our discretion, without charge to the customer. Our estimate of future warranty costs is largely based on historical experience factors, including product failure rates, material usage, and service delivery cost incurred in correcting product failures. These provisions are reviewed and adjusted by management periodically to reflect actual and anticipated experience. The warranty costs are reflected in our consolidated statements of operations within cost of revenues.

Income taxes

We account for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in our consolidated financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statement carrying amount and the tax bases of assets and liabilities using enacted income tax rates in effect for the year in which the differences are expected to be recovered or settled. The effect of a change in income tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

We recognize deferred tax assets to the extent that we believe these assets are more likely than not to be realized. In making such a determination, we consider all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If we determine that we would be able to realize our deferred tax asset in the future in excess of their net recorded amount, we would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes. Based on 2021 income and forecast of future taxable income, management concluded that all of the valuation allowance on the Company's UK entity's deferred tax assets was no longer needed and recorded a benefit of $7.7 million related to the reversal of this valuation allowance in 2021.

We may be subject to income tax audits in all the jurisdictions in which we operate and, as a result, we must also assess exposures to any potential issues arising from current or future audits of current and prior years' tax returns. Accordingly, we must assess such potential exposures and, where necessary, provide a reserve to cover any expected loss. We recognize the benefit of a tax position if it is more likely than not to be sustained. Recognized tax positions are measured at the largest amount more likely than not of being realized upon settlement. To the extent that we establish a reserve, our income tax expense would be increased. If we ultimately determine that payment of these amounts is unnecessary, we reverse the liability and recognize an income tax benefit during the period in which new information becomes available indicating the liability is no longer necessary. We record an additional income tax expense in the period in which new information becomes available indicating the tax liability is greater than our original estimate.

Share-based compensation

We recognize all share-based compensation expense as a cost in the consolidated financial statements. Equity classified awards are measured at the grant date fair value of the award and expense is recognized, net of estimated forfeitures, on a straight-line basis over the requisite service period for each separately vesting portion of the award and forfeiture rates are periodically updated for actual experience over the vesting term. We estimate the fair value of share options granted using the Black-Sholes option pricing model.

JOBS Act accounting election

We are an emerging growth company, as defined in the JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, are subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

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

Interest rate risk

We had $28.0 million of debt outstanding on our term loan facility and $0.0 million of debt outstanding on our revolving credit facility as of December 31, 2022 under our BofA Credit Agreement. We are exposed to interest rate risk from fluctuations in the US Dollar London Interbank Offered Rate, or LIBOR, that is a component of the interest rate used to calculate interest expense on the debt.

Interest accrues on the outstanding principal amount of the term loan on a quarterly basis and is equal to the US Dollar LIBOR rate per annum determined by reference to the 1-month, 3-month or 6-month US Dollar LIBOR rate as selected by the Company, plus an applicable margin between 1.75% and 2.25% as determined by our financial performance as measured by the consolidated leverage ratio. At December 31, 2022, the applicable margin was 1.75% and the effective interest rate on the term loan was 6.86%. A hypothetical 100-basis point increase in interest rates, and assuming a constant applicable margin and required principal payments, would result in an additional $0.3 million in interest expense related to our external debt per year.

In July 2017, the United Kingdom’s Financial Conduct Authority ("FCA"), which regulates LIBOR, announced it will no longer compel banks to submit rates for the calculation of LIBOR after 2021 and in March 2021 confirmed the dates each tenor would cease. The 1-week and 2-month US Dollar LIBOR tenors ceased on December 31, 2021 and the remaining five US Dollar tenors (overnight, 1-month, 3-month, 6-month and 12-month) will cease on June 30, 2023. The Company's current term loan with Bank of America was borrowed as a Eurodollar loan which is indexed to the Eurodollar Rate (the rate equal to the London Interbank Offered Rate). The BofA Credit Agreement matures on November 17, 2026, which is after the cessation of all tenors of the US Dollar LIBOR rate.

The BofA Credit Agreement contemplates the discontinuation of LIBOR and provides that a benchmark replacement rate shall be determined by reference to other applicable rates and additionally allows the Company to switch to a Base Rate loan, as defined in the BofA Credit Agreement. The Company will continue to actively assess the related opportunities and risks involved in this transition.

Foreign currency exchange rate risk

We conduct business in all parts of the world and are thereby exposed to market risks related to fluctuations in foreign currency exchange rates. The U.S. dollar is the single largest currency in which our revenue contracts are denominated. Any decline in the value of local foreign currencies against the U.S. dollar results in our products and services being more expensive to a potential foreign customer. In those instances where our goods and services have already been sold, receivables may be more difficult to collect. Additionally, in jurisdictions where the revenue contracts are denominated in U.S. dollars and operating expenses are incurred in the local currency, any decline in the value of the U.S. dollar will have an unfavorable impact to operating margins. We have not entered into any foreign currency hedging transactions. We do not purchase or hold any derivative financial instruments for speculation or arbitrage.

We do not hold any cash in any investment accounts and all cash is deposited with financial institutions that management believes are of high credit quality. Our cash consists primarily of U.S. dollar denominated demand accounts.

Credit risk

We consider the credit risk of all customers and regularly monitor credit risk exposures in our trade receivables. Our standard credit terms with our customers are generally net 30 to 60 days. We had one customer representing more than 10% of trade receivables at December 31, 2021 and 2022. In addition, we had two customers representing more than 10% of revenue for the year ended December 31, 2021 and one customer representing more than 10% of revenues for the year ended December 31, 2022.

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 set forth on pages F-1 through F-29 of this Annual Report on Form 10-K.

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

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, performed an evaluation of the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities and Exchange Act of 1934, as amended, or the Exchange Act), as of December 31, 2022, the end of the period covered by this Annual Report on Form 10-K. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission'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 Chief Executive and Chief Financial Officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded, that as of such date, our disclosure controls and procedures were effective at a reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with U.S. GAAP. Under the supervision of, and with the participation of our Chief Executive Officer and Chief Financial Officer, management assessed the effectiveness of internal controls over financial reporting as of December 31, 2022.

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

Management based its assessment on criteria established in "Internal Control Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2022.

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm due to a transition period established by the rules of the SEC for "emerging growth companies".

Changes in Internal Control

There were no changes in our internal control over financial reporting identified in management's evaluation pursuant to Rules 13a-15(e) and 15d-15(e) of the Exchange Act for the year ended December 31, 2022 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Effectiveness of Controls and Procedures

None.

Item 9B. Other Information.

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspection.

Not Applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information required by Part III, Item 10, will be included in our Proxy Statement relating to our 2023 annual meeting of shareholders to be filed with the SEC within 120 days after the end of our year ended December 31, 2022, and is incorporated herein by reference.

Item 11. Executive Compensation.

Information required by Part III, Item 11, will be included in our Proxy Statement relating to our 2023 annual meeting of shareholders to be filed with the SEC within 120 days after the end of our year ended December 31, 2022, and is incorporated herein by reference.

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

Information required by Part III, Item 12, will be included in our Proxy Statement relating to our 2023 annual meeting of shareholders to be filed with the SEC within 120 days after the end of our year ended December 31, 2022, and is incorporated herein by reference.

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

Information required by Part III, Item 13, will be included in our Proxy Statement relating to our 2023 annual meeting of shareholders to be filed with the SEC within 120 days after the end of our year ended December 31, 2022, and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

Information required by Part III, Item 14, will be included in our Proxy Statement relating to our 2023 annual meeting of shareholders to be filed with the SEC within 120 days after the end of our year ended December 31, 2022, and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

Documents filed as part of this annual report on Form 10-K:

(1) ***Financial Statements***. The following index lists consolidated financial statements and notes thereto filed as part of this annual report on Form 10-K:

Report of Independent Registered Public Accounting Firm	F-2
Consolidated Balance Sheets as of December 31, 2021 and 2022	F-3
Consolidated Statements of Operations for the years ended December 31, 2020, 2021 and 2022	F-4
Consolidated Statements of Comprehensive Income for the years ended December 31, 2020, 2021 and 2022	F-5
Consolidated Statements of Shareholders' Equity for the years ended December 31, 2020, 2021 and 2022	F-6
Consolidated Statements of Cash Flows for the years ended December 31, 2020, 2021 and 2022	F-7
Notes to Consolidated Financial Statements	F-8

(2) ***Financial Statement Schedules.*** All schedules have been omitted because they are not applicable as the required information is included in the consolidated financial statements or notes thereto.

(3) ***Exhibits.*** A list of exhibits filed or furnished with this report on Form 10-K (or incorporated by reference to exhibits previously filed by Cambium) is provided in the accompanying Exhibit Index.

Item 16. Form 10-K Summary

None.

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
1.1	Underwriting Agreement dated December 3, 2020 by and among Cambium Networks Corporation, the Underwriters and the Selling Shareholders	8-K	001-38952	1.1	December 4, 2020
3.1	Form of Amended and Restated Memorandum and Articles of Association to be effective upon completion of this offering	S-1/A	333-231789	3.1	June 13, 2019
4.1	Form of Ordinary Share Certificate of Registrant	S-1/A	333-231789	4.1	June 24, 2019
4.2	Form of Shareholders Agreement by and among Registrant and certain security holders of Registrant to be effective upon completion of this offering	S-1/A	333-231789	4.2	June 13, 2019
4.3	Description of Registrant's Securities Registered Pursuant to Section 12 of the Securities and Exchange Act of 1934	10-K	001-38952	4.3	March 1, 2021
10.1+	Form of Indemnification Agreement entered into between Registrant and its directors and executive officers	S-1	333-231789	10.1	May 29, 2019
10.2	Renewal Lease by Reference to an Existing Lease, Part Unit A, Linhay Business Park, Eastern Road, Ashburton, Devon TQ13 7UP, United Kingdom, dated as of November 22, 2016, by and between Registrant and Stephanie Myers Palk, Richard John Palk and Alison June Palk	S-1	333-231789	10.2	May 29, 2019
10.3	Renewal Lease by Reference to an Existing Lease, Unit B2/3, Linhay Business Park, Eastern Road, Ashburton, Devon TQ13 7UP, United Kingdom, dates as of November 22, 2016, by and between Registrant and Stephanie Myers Palk, Richard John Palk and Alison June Palk	S-1	333-231789	10.3	May 29, 2019
10.4	Renewal Lease by Reference to an Existing Lease, Unit B2/3, Linhay Business Park, Eastern Road, Ashburton, Devon TQ13 7UP, United Kingdom, dated as of April 9, 2018, by and between Registrant and Stephanie Myers Palk, Richard John Palk and Alison June Palk	S-1	333-231789	10.4	May 29, 2019
10.5	Renewal Lease by Reference to an Existing Lease, Unit D1, Linhay Business Park, Eastern Road, Ashburton, Devon TQ13 7UP, United Kingdom, dated as of November 22, 2016, by and between Registrant and Stephanie Myers Palk, Richard John Palk and Alison June Palk	S-1	333-231789	10.5	May 29, 2019
10.6	Renewal Lease by Reference to an Existing Lease, Unit D1, Linhay Business Park, Eastern Road, Ashburton, Devon TQ13 7UP, United Kingdom, dated as of April 9, 2018, by and between Registrant and Stephanie Myers Palk, Richard John Palk and Alison June Palk	S-1	333-231789	10.6	May 29, 2019
10.7	Office Lease, dated as of January 31, 2012, by and between Cambium Networks, Inc. and Atrium at 3800 Golf LLC	S-1	333-231789	10.7	May 29, 2019

10.8	The First Amendment, dated March 6, 2012, by and between Cambium Networks, Inc. and Atrium at 3800 Golf LLC	S-1	333-231789	10.8	May 29, 2019
10.9	The Second Amendment, dated February 21, 2013, by and between Cambium Networks, Inc. and Atrium at 3800 Golf LLC	S-1	333-231789	10.9	May 29, 2019
10.10	The Third Amendment, dated June 3, 2015, by and between Cambium Networks, Inc. and Atrium at 3800 Golf LLC	S-1	333-231789	10.10	May 29, 2019
10.11	The Fourth Amendment, dated January 18, 2018, by and between Cambium Networks, Inc. and Atrium at 3800 Golf LLC	S-1	333-231789	10.11	May 29, 2019
10.12	Lease Deed, dated as of June 20, 2016, by and between Cambium Networks Consulting Private Limited and Umiya Holdings Private Limited	S-1	333-231789	10.12	May 29, 2019
10.13	Lease, dated as of December 4, 2017, by and between Cambium Networks, Inc. and Silicon Valley Center Office LLC	S-1	333-231789	10.13	May 29, 2019
10.14++	Corporate Supply Agreement between Cambium Networks Limited and Flextronics Telecom Systems, Ltd. dated as of April 23, 2012	S-1	333-231789	10.14	May 29, 2019
10.15+	2019 Employee Share Purchase Plan	S-1/A	333-231789	10.15	June 13, 2019
10.16	Intentionally Omitted				
10.17+	2019 Share Incentive Plan	S-1/A	333-231789	10.17	June 13, 2019
10.18+	Form of Share Option Grant Notice and Restricted Share Award Agreement under 2019 Share Incentive Plan (to be executed by Atul Bhatnagar)	S-1/A	333-231789	10.18	June 13, 2019
10.19+	Form of Restricted Share Grant Notice and Restricted Share Award Agreement under 2019 Share Incentive Plan (to be executed by Atul Bhatnagar)	S-1/A	333-231789	10.19	June 13, 2019
10.20+	Form of Restricted Share Grant Notice and Restricted Share Award Agreement under 2019 Share Incentive Plan (to be executed by Atul Bhatnagar, Bryan Sheppeck and Ronald Ryan)	S-1/A	333-231789	10.20	June 13, 2019
10.24+	Employment agreement, dated as of February 15, 2013, between Cambium Networks, Inc. and Atul Bhatnagar	S-1/A	333-231789	10.24	June 13, 2019
10.25+	Sales Incentive Plan Document for Regional Vice Presidents: SVP Global Channels	S-1/A	333-231789	10.25	June 13, 2019
10.26+	Sales Incentive Plan Document for SVP Global Sales	S-1/A	333-231789	10.26	June 13, 2019
10.27+	Form of Executive Restricted Share Unit Grant	S-1/A	333-231789	10.27	June 24, 2019
10.28+	Form of Executive Stock Option Grant	S-1/A	333-231789	10.28	June 24, 2019
10.29+	Form of Director Stock Option Grant	S-1/A	333-231789	10.29	June 24, 2019
10.34	Credit Agreement dated as of November 17, 2021, between Cambium Networks and Bank of America	8-K	001-38952	10.34	November 18, 2021

10.35	Security Agreement dated as of November 17, 2021 between Cambium Networks and Bank of America	8-K	001-38952	10.35	November 18, 2021
10.36	Lease Deed, dated as of April 12, 2021, by and between Cambium Networks Private Limited and Mr. Jimmy Paymaster and Qualitas Property Consulting LLP	10-K	001-38952	10.36	February 24, 2022
10.37	Lease Deed, dated as of August 5, 2021, by and between Cambium Networks Private Limited and Umiya Holdings Private Limited and Others	10-K	001-38952	10.37	February 24, 2022
10.38	First Amendment to Lease, dated as of December 9 2021, by and between Cambium Networks, Inc. and Silicon Valley Center Office LLC	10-K	001-38952	10.38	February 24, 2022
10.39+	Offer Letter, dated as of April 10, 2022, between Cambium Networks, Inc. and Andrew Bronstein	10-Q	001-38952	10.39	May 6, 2022
21.1	Subsidiaries of the Registrant	S-1	333-231789	21.1	May 29, 2019
23.1*	Consent of KPMG LLP, independent registered public accounting firm				
31.1*	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
31.2*	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
32.1**	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
32.2**	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the inline XBRL 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)				

+ Indicates management contract or compensatory plan

++ Confidential treatment has been granted for portions of this exhibit. These portions have been omitted and have been filed separately with the SEC.

Portions of the exhibit have been excluded because it both (i) is not material and (ii) would be competitively harmful if publicly disclosed.

* Filed herewith.

** The certifications furnished in Exhibits 32.1 and 32.2 hereto are deemed to accompany this Annual Report on Form 10-K and will not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, except to the extent that the Registrant specifically incorporates it by reference.

SIGNATURES

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

Cambium Networks Corporation

Date: February 27, 2023

By: /s/ ANDREW P. BRONSTEIN
Andrew P. Bronstein
Chief Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Report has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ ATUL BHATNAGAR **Atul Bhatnagar**	President and Chief Executive Officer (Principal Executive Officer)	February 27, 2023
/s/ ANDREW P. BRONSTEIN **Andrew P. Bronstein**	Chief Financial Officer (Principal Financial Officer)	February 27, 2023
/s/ JOHN M. BECERRIL **John M. Becerril**	Chief Accounting Officer (Principal Accounting Officer)	February 27, 2023
/s/ ROBERT AMEN **Robert Amen**	Chairman of the Board	February 27, 2023
/s/ ALEXANDER R. SLUSKY **Alexander R. Slusky**	Director	February 27, 2023
/s/ BRUCE FELT **Bruce Felt**	Director	February 27, 2023
/s/ VIKRAM VERMA **Vikram Verma**	Director	February 27, 2023
/s/ KEVIN LYNCH **Kevin Lynch**	Director	February 27, 2023

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Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Cambium Networks Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Cambium Networks Corporation and subsidiaries (the Company) as of December 31, 2021 and 2022, the related consolidated statements of operations, comprehensive income, shareholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2022, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2022, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

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

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

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

/s/ KPMG LLP

We have served as the Company's auditor since 2019.

Chicago, Illinois
February 27, 2023

CAMBIUM NETWORKS CORPORATION
Consolidated Balance Sheets
as of December 31, 2021 and 2022
(in thousands, except for share and per share amounts)

	December 31, 2021	December 31, 2022
ASSETS		
Current assets		
Cash	$ 59,291	$ 48,162
Receivables, net of allowances of $683 and $577	69,773	89,321
Inventories, net	33,777	57,068
Recoverable income taxes	860	117
Prepaid expenses	12,170	11,857
Other current assets	4,718	6,464
Total current assets	180,589	212,989
Noncurrent assets		
Property and equipment, net	10,490	11,271
Software, net	5,867	8,439
Operating lease assets	5,899	4,011
Intangible assets, net	10,777	9,173
Goodwill	9,842	9,842
Deferred tax assets, net	7,604	12,782
Other noncurrent assets	1,200	955
TOTAL ASSETS	$ 232,268	$ 269,462
LIABILITIES AND EQUITY		
Current liabilities		
Accounts payable	$ 28,241	$ 31,284
Accrued liabilities	21,948	28,042
Employee compensation	16,601	7,394
Current portion of long-term external debt, net	2,489	3,158
Deferred revenues	6,880	8,913
Other current liabilities	5,981	8,429
Total current liabilities	82,140	87,220
Noncurrent liabilities		
Long-term external debt, net	26,965	24,463
Deferred revenues	5,363	8,617
Noncurrent operating lease liabilities	4,112	2,170
Other noncurrent liabilities	1,551	1,619
Total liabilities	120,131	124,089
Shareholders' equity		
Share capital; $0.0001 par value; 500,000,000 shares authorized at December 31, 2021 and 2022; 26,892,082 shares issued and 26,735,175 outstanding at December 31, 2021 and 27,522,734 shares issued and 27,313,273 outstanding at December 31, 2022	3	3
Additional paid in capital	124,117	138,997
Treasury shares, at cost, 156,907 shares at December 31, 2021 and 209,461 shares at December 31, 2022	(3,906)	(4,922)
Accumulated (deficit) earnings	(7,378)	12,822
Accumulated other comprehensive loss	(699)	(1,527)
Total shareholders' equity	112,137	145,373
TOTAL LIABILITIES AND EQUITY	$ 232,268	$ 269,462

The accompanying Notes are an integral part of these Consolidated Financial Statements.

CAMBIUM NETWORKS CORPORATION
Consolidated Statements of Operations
for the Years ended December 31, 2020, 2021 and 2022
(in thousands, except for share and per share amounts)

	Year Ended December 31,		
	2020	**2021**	**2022**
Revenues	$ 278,459	$ 335,854	$ 296,899
Cost of revenues	139,049	175,058	151,759
Gross profit	139,410	160,796	145,140
Operating expenses			
Research and development	46,371	51,322	49,865
Sales and marketing	37,756	41,819	44,452
General and administrative	24,696	25,065	24,982
Depreciation and amortization	6,639	6,171	5,961
Total operating expenses	115,462	124,377	125,260
Operating income	23,948	36,419	19,880
Interest expense, net	5,326	4,269	1,977
Other expense (income), net	491	244	(114)
Income before income taxes	18,131	31,906	18,017
Benefit for income taxes	(444)	(5,515)	(2,183)
Net income	$ 18,575	$ 37,421	$ 20,200
Earnings per share			
Basic	$ 0.72	$ 1.42	$ 0.75
Diluted	$ 0.70	$ 1.31	$ 0.72
Weighted-average number of shares outstanding to compute net earnings per share			
Basic	25,707,092	26,421,087	26,919,550
Diluted	26,403,112	28,628,136	28,025,278
Share-based compensation included in costs and expenses:			
Cost of revenues	$ 67	$ 152	$ 219
Research and development	1,599	3,044	4,532
Sales and marketing	980	1,935	2,603
General and administrative	790	2,586	3,326
Total share-based compensation	$ 3,436	$ 7,717	$ 10,680

The accompanying Notes are an integral part of these Consolidated Financial Statements.

CAMBIUM NETWORKS CORPORATION
Consolidated Statements of Comprehensive Income
for the Years ended December 31, 2020, 2021 and 2022
(in thousands)

	Year Ended December 31,		
	2020	2021	2022
Net income	$ 18,575	$ 37,421	$ 20,200
Other comprehensive loss			
Foreign currency translation adjustment	(185)	(135)	(828)
Comprehensive income	**$ 18,390**	**$ 37,286**	**$ 19,372**

The accompanying Notes are an integral part of these Consolidated Financial Statements.

CAMBIUM NETWORKS CORPORATION
Consolidated Statements of Shareholders' Equity
for the Years ended December 31, 2020, 2021 and 2022
(in thousands)

	Share Capital						
	Shares	Amount	Additional paid in capital	Treasury shares	Accumulated (deficit) equity	Accumulated other comprehensive loss	Total shareholders' equity
Balance at December 31, 2019	25,673	$ 3	$ 104,773	$ (1,094)	$ (63,374)	$ (379)	$ 39,929
Net income	—	—	—	—	18,575	—	18,575
Share-based compensation	—	—	3,436	—	—	—	3,436
Issuance of vested shares	234	—	—	—	—	—	—
Treasury shares withheld for net settlement	(11)	—	—	4	—	—	4
Proceeds from exercise of share options	139	—	1,628	—	—	—	1,628
Foreign currency translation	—	—	—	—	—	(185)	(185)
Balance at December 31, 2020	26,035	$ 3	$ 109,837	$ (1,090)	$ (44,799)	$ (564)	$ 63,387
Net income	—	—	—	—	37,421	—	37,421
Share-based compensation	—	—	7,717	—	—	—	7,717
Issuance of ordinary shares under ESPP	82	—	1,756	—	—	—	1,756
Issuance of vested shares	229	—	—	—	—	—	—
Treasury shares withheld for net settlement	(65)	—	—	(2,816)	—	—	(2,816)
Proceeds from exercise of share options	454	—	4,807	—	—	—	4,807
Foreign currency translation	—	—	—	—	—	(135)	(135)
Balance at December 31, 2021	26,735	$ 3	$ 124,117	$ (3,906)	$ (7,378)	$ (699)	$ 112,137
Net income	—	—	—	—	20,200	—	20,200
Share-based compensation	—	—	10,680	—	—	—	10,680
Issuance of ordinary shares under ESPP	152	—	1,966	—	—	—	1,966
Issuance of vested shares	236	—	—	—	—	—	—
Treasury shares withheld for net settlement	(52)	—	—	(1,016)	—	—	(1,016)
Proceeds from exercise of share options	242	—	2,234	—	—	—	2,234
Foreign currency translation	—	—	—	—	—	(828)	(828)
Balance at December 31, 2022	27,313	$ 3	$ 138,997	$ (4,922)	$ 12,822	$ (1,527)	$ 145,373

The accompanying Notes are an integral part of these Consolidated Financial Statements.

CAMBIUM NETWORKS CORPORATION
Consolidated Statements of Cash Flows
for the Years ended December 31, 2020, 2021 and 2022
(in thousands)

	Year Ended December 31,		
	2020	2021	2022
Cash flows from operating activities:			
Net income	$ 18,575	$ 37,421	$ 20,200
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Depreciation	3,685	3,356	3,913
Amortization of software and intangible assets	3,583	3,621	3,683
Amortization of debt issuance costs	546	1,130	304
Share-based compensation	3,436	7,717	10,680
Deferred income taxes	(1,072)	(6,065)	(5,189)
Provision for inventory excess and obsolescence	1,896	11	3,743
Other	540	(207)	(125)
Change in assets and liabilities:			
Receivables	3,165	(11,174)	(12,906)
Inventories	5,696	174	(27,034)
Prepaid expenses	1,163	(8,034)	286
Accounts payable	6,097	(2,710)	2,767
Accrued employee compensation	11,116	1,885	(8,866)
Accrued liabilities	1,495	2,517	(427)
Other assets and liabilities	(3,020)	318	5,917
Net cash provided by (used in) operating activities	56,901	29,960	(3,054)
Cash flows from investing activities:			
Purchase of property and equipment	(3,407)	(6,259)	(4,574)
Purchase of software	(1,659)	(3,907)	(4,671)
Cash paid for acquisition	(334)	—	—
Net cash used in investing activities	(5,400)	(10,166)	(9,245)
Cash flows from financing activities:			
Proceeds from issuance of term loan	—	29,812	—
Proceeds from issuance of revolver debt	10,000	—	—
Repayment of term loan	(10,000)	(55,250)	(1,969)
Repayment of revolver debt	(10,000)	—	—
Payment of debt issuance costs	—	(1,220)	—
Issuance of ordinary shares under ESPP	—	1,756	1,966
Taxes paid from shares withheld	4	(2,816)	(986)
Proceeds from share option exercises	1,628	4,807	2,234
Payment to extinguish debt	—	(42)	—
Net cash (used in) provided by financing activities	(8,368)	(22,953)	1,245
Effect of exchange rate on cash	(7)	(22)	(75)
Net increase (decrease) in cash	43,126	(3,181)	(11,129)
Cash, beginning of period	19,346	62,472	59,291
Cash, end of period	$ 62,472	$ 59,291	$ 48,162
Supplemental disclosure of cash flow information:			
Income taxes paid	$ 2,232	$ 779	$ 1,349
Interest paid	$ 3,998	$ 2,062	$ 807

The accompanying Notes are an integral part of these Consolidated Financial Statements.

Note 1. Description of Business and Summary of Significant Accounting Policies

Business

Cambium Networks Corporation (“Cambium” or "Cambium Networks" or the “Company”), incorporated under the laws of the Cayman Islands, is a holding company whose principal operating entities are Cambium Networks, Ltd. (UK), Cambium Networks, Inc. (USA), and Cambium Networks Private Limited (India). On June 26, 2019, the Company completed an Initial Public Offering and the Company's ordinary shares began trading on the Nasdaq Global Markets.

Cambium Networks Corporation and its wholly owned subsidiaries design, develop, and manufacture wireless broadband and Wi-Fi networking infrastructure solutions that are used by businesses, governments, and service providers in urban, suburban and rural environments. Cambium Networks' products simplify and automate the design, deployment, optimization, and management of broadband and Wi-Fi access networks through intelligent automation.

The Company operates on a calendar year ending December 31. As such, all references to 2020, 2021 and 2022 contained within these notes relate to the calendar year, unless otherwise indicated.

Basis of Presentation

The Company’s consolidated financial statements and accompanying notes are prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”) and include the accounts of Cambium Networks Corporation and its wholly owned subsidiaries. All intercompany balances and transactions have been eliminated.

In 2022, management determined that certain costs previously included as general and administrative expenses related to other functions of the business. Prior period results have been revised to reflect the allocation of these costs to their respective functions. These costs primarily include facility costs such as leased space and shared IT costs. Revisions were made to increase research and development expense by $3.4 million and selling and marketing expense by $1.0 million and decrease general and administrative expense by $4.4 million for the year ended December 31, 2021 and to increase research and development expense by $3.2 million and selling and administrative expense by $1.0 million and decrease general and administrative expense by $4.2 million for the year ended December 31, 2020. These revisions were concluded to be immaterial and had no impact on operating income.

Use of Accounting Estimates

The preparation of consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. On an ongoing basis, the Company evaluates these estimates, including those related to the provision for excess and obsolete inventory, the carrying amount of estimated inventory returns, the estimated amount expected to be refunded to customers in respect of inventory returns, fair value of equity awards granted to employees and the associated forfeiture rates, fair value of assets acquired, liabilities assumed, goodwill and identifiable intangible assets in business combinations, leases, provision for income taxes, recoverability of deferred tax assets. The Company bases estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances. Actual results could differ from those estimates.

Segments

Management has determined that it operates as one operating segment and one reporting unit as it only reports financial information on an aggregate and consolidated basis to its Chief Executive Officer, who is the Company’s chief operating decision maker ("CODM"). Decisions about resource allocation or operating performance assessments are not made below a total company level. Consequently, impairment testing of goodwill is performed at the consolidated level as one reporting unit.

Recognition of revenues

Revenues consist primarily of revenues from the sale of hardware products. Revenues also include amounts for software products, extended warranty on hardware products and software subscription services. Substantially all products are sold through distributors and other channel partners, such as resellers and systems integrators.

The Company recognizes revenue to reflect the transfer of control of promised products or services to a customer in an amount that reflects the consideration to which the Company expects to be entitled in exchange for products or services.

The Company accounts for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable.

The Company identifies its distinct performance obligations under each contract. A performance obligation is a promise in a contract to transfer a distinct product or service to the customer. Hardware products with essential embedded software, software products, extended warranty on hardware products and software subscriptions have been identified as separate performance obligations.

The transaction price is the amount of consideration to which the Company expects to be entitled in exchange for transferring products or services to a customer. Exchanges made as part of the Company's stock rotation program meet the definition of a right of return. An adjustment to revenue is made to adjust the transaction price to exclude the consideration related to products expected to be returned. The Company records an asset at the carrying amount of the estimated stock returns and a liability for the estimated amount expected to be refunded to the customer. The transaction price also excludes other forms of consideration provided to the customer, such as volume-based rebates and cooperative marketing allowances.

The Company recognizes revenue when, or as, it satisfies a performance obligation by transferring control of a promised product or service to a customer. Revenue from hardware products with embedded software is recognized when control is transferred to the customer, which is typically at the time of shipment. Software revenue is from perpetual license software and is recognized at the point in time the customer is able to use or benefit from the software. Extended warranty is available for purchase on hardware products and is a performance obligation that is satisfied over time, beginning on the effective date of the warranty term and ending on the expiration of the warranty term. The Company recognizes revenue on extended warranties on a straight-line basis over the warranty period. Revenue from subscription services is recognized ratably over the term in which the services are provided and our performance obligation is satisfied.

Multiple performance obligations

The Company enters into revenue arrangements that may consist of multiple performance obligations, such as hardware and extended warranty. The Company allocates the transaction price to each performance obligation on a relative standalone selling price basis for each distinct product or service in the contract. The best evidence of standalone selling price is the observable price of a product or service when the Company sells that product or service separately in similar circumstances and to similar customers. If a standalone selling price is not directly observable, the Company estimates the transaction price allocated to each performance obligation using the expected costs plus a margin approach.

Receivables and concentration of credit risk

Trade accounts receivable are recorded at invoiced amounts, net of the allowance for credit losses. The Company considers the credit risk of all customers and regularly monitors credit risk exposure in its trade receivables. The Company's standard credit terms with their customers are generally net 30 to 60 days. The Company had one customer representing more than 10% of trade receivables at December 31, 2021 and 2022. The Company had two customers representing more than 10% of revenues for the years ended December 31, 2020 and 2021 and one customer representing more than 10% of revenues for the year ended December 31, 2022.

The Company establishes an allowance for credit losses to present the net amount of accounts receivable expected to be collected. The allowance is determined by using the loss-rate method, which requires an estimation of loss rates based on historical loss experience adjusted for factors that are relevant to determining the expected collectability of accounts receivable. Some of these factors include macroeconomic conditions that correlate with historical loss experience, delinquency trends, aging behavior of receivables, and credit and liquidity indicators for individual customers.

Inventory

The Company's inventories are primarily finished goods for resale and, to a lesser extent, raw materials, which have been either consigned to the Company's third-party manufacturers or are held by the Company. Inventories are stated at the lower of cost or net realizable value. In determining the cost of raw materials, consumables and goods purchased for resale, the weighted average purchase price is used. For finished goods, cost is computed as production cost including capitalized inbound freight costs.

The valuation of inventory also requires the Company to estimate excess or obsolete inventory. The determination of excess or obsolete inventory is based on the cost of inventory on hand versus the Company's forecast of demand, and in consideration of historical usage and management's judgment. Any adjustments to the valuation of inventory are included in cost of revenues.

Property and equipment

Per ASC 360, *Property, Plant, and Equipment*, property and equipment is stated at cost. The Company calculates depreciation expense using the straight-line method over the estimated useful lives of each asset based on its asset class. Leasehold improvements are amortized over the shorter of their useful lives or the lease term. See Note 3 – Property and equipment for the useful lives for each asset class.

Upon retirement or disposition, the asset cost and related accumulated depreciation are removed with any gain or loss recognized in operating expense in the Consolidated Statements of Operations. For the years ended 2020, 2021 and 2022, the loss recognized was immaterial.

Software

Software may be purchased or developed internally for internal use. Costs related to internal use software are accounted for in accordance with ASC 350-40, *Internal Use Software.* Costs are expensed as incurred during the preliminary project stage of an internal use software project. Costs are capitalized once the project has been approved by management and is in the application development stage. Post implementation/operation costs, such as maintenance and training costs, are expensed as incurred. Any costs incurred to provide upgrades or enhancements are capitalized only if they provide additional functionality that did not previously exist.

Amortization of internal use software begins when the software is ready for internal use and is amortized over its estimated useful life. The amortization expense for internal use software is computed using the straight-line method over three to seven years.

Costs related to certain software, which is available for sale, are capitalized in accordance with ASC 985-20, *Costs of Software to be Sold, Leased, or Marketed*, when the resulting product reaches technological feasibility. The Company generally determines technological feasibility when it has a detailed program design that takes product function, feature and technical requirements to their most detailed, logical form and the product is ready for coding. The Company does not typically capitalize costs related to the development of first-generation product offerings as technological feasibility generally coincides with general availability of the software.

Amortization of software costs to be sold or marketed externally begins when the product is available for sale to customers and is amortized using the straight-line method over its estimated useful life of three years.

Business Combinations

The Company applies the provisions of ASC 805, *Business Combinations*, in the accounting for its acquisitions. It requires the Company to recognize separately from goodwill the assets acquired and the liabilities assumed at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred and the net of the acquisition date fair values of the assets acquired and the liabilities assumed. While the Company uses its best estimates and assumptions to accurately value assets acquired and liabilities assumed at the acquisition date, its estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, it records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the Consolidated Statements of Operations.

Critical accounting estimates in valuing certain intangible assets include but are not limited to future expected cash flows from customer relationships, as well as assumptions about customer attrition rate.

Other estimates associated with the accounting for acquisitions may change as additional information becomes available regarding the assets acquired and liabilities assumed.

Goodwill and intangible assets

Goodwill represents the excess purchase price over the estimated fair value of net assets acquired in a business combination. Goodwill is measured at cost and is not amortized. Intangible assets acquired, either individually or with a group of assets, are initially recognized and measured at fair value. The Company uses third-party specialists to assist management to determine fair values and estimated useful lives for intangible assets acquired in business combinations. Intangible assets with finite useful lives are amortized on a straight-line basis over their estimated useful lives of between 3 and 18 years. The Company has no intangible assets with indefinite lives.

In accordance with ASC 350, *Goodwill and Other*, the Company assesses goodwill for impairment at least annually and whenever events or circumstances that would more likely than not, reduce the fair value below its carrying value. The Company tested goodwill for impairment at December 31. The Company did not recognize an impairment loss of goodwill for the years ended December 31, 2020, 2021 and 2022.

Annual impairment testing is completed at the reporting unit level. Management has concluded the Company operates as one reporting unit and one operating segment for annual impairment testing.

In completing its impairment evaluations, the Company first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. In performing this qualitative assessment, the Company assesses relevant events and changes in circumstances, including industry and market conditions, operating results, business plans, and entity-specific events that would affect the fair value or the carrying amount of a reporting unit. If it is more likely than not that the fair value of a reporting unit is less than its carrying value, the Company determines the fair value of the

reporting unit and compares the fair value to its carrying value. If the fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is not considered impaired and no further steps are required.

Impairment of long-lived assets

The Company evaluates its long-lived assets, including property and equipment, software, right of use assets, and definite-lived intangible assets for impairment by completing a quarterly qualitative assessment and whenever events or changes in circumstances indicate that the carrying value of these assets may not be recoverable. An impairment loss is recognized when the net book value of such assets exceeds the estimated future undiscounted cash flows attributable to the assets or asset group. If impairment is indicated, the asset is written down to its estimated fair value. The Company did not recognize any material impairment losses of long-lived assets for the years ended December 31, 2020, 2021 and 2022.

Leases

The Company has both cancelable and noncancelable operating leases for office space, vehicles, and office equipment. The Company records leases in accordance with ASC 842, *Leases*, ("ASC 842"). The Company records a right-of-use asset and lease liability on its consolidated balance sheet for all leases that qualify. The operating lease liability represents the present value of the future minimum lease payments over the lease term using the Company's incremental borrowing rate at the lease commencement date. The right-of-use asset reflects adjustments for the derecognition of deferred rent and prepaid rent. Leases with an initial term of 12 months or less are not recorded on the Company's consolidated balance sheet, and are expensed on a straight-line basis over the lease term. The Company does not include any renewal periods in the lease term for its leases as sufficient economic factors do not exist that would compel it to continue to use the underlying asset beyond the initial non-cancelable term. The Company has elected to combine the lease and non-lease components into a single lease component for all of its leases. See Note 15 – Leases for further details.

Product warranties

The Company provides a standard warranty on its products, with the term depending on the product, and records a liability for the estimated future costs associated with potential warranty claims. Provisions for warranty claims are recorded at the time products are sold based on historical experience factors including product failure rates, material usage, and service delivery cost incurred in correcting product failures. These provisions are reviewed and adjusted by management periodically to reflect actual and anticipated experience. The warranty costs are reflected in the Company's consolidated statements of operations within cost of revenues. In certain circumstances, the Company may have recourse from its contract manufacturers for replacement cost of defective products, which it also factors into its warranty liability assessment.

Income taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in its financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statement carrying amount and the tax basis of assets and liabilities using enacted income tax rates in effect for the year in which the differences are expected to be recovered or settled. The effect of a change in income tax rates on deferred tax assets and liabilities is recognized in the income tax provision in the period that includes the enactment date.

In assessing the realizability of deferred tax assets, the Company considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized and adjusts the valuation allowances accordingly. In making such a determination, the Company considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations.

In general, it is the practice and intention of the Company to reinvest the earnings of its subsidiaries in those operations. As of December 31, 2020, 2021 and 2022, the Company had not made a provision for withholding taxes on approximately $13.8 million, $27.2 million and $41.7 million, respectively, of undistributed earnings at each period-end that are indefinitely reinvested. Generally, such amounts become subject to taxation upon the remittance of dividends and under certain other circumstances. It is not practicable to estimate the amount of deferred tax liability to the undistributed earnings in these subsidiaries.

The Company may be subject to income tax audits in all of the jurisdictions in which it operates and, as a result, must also assess exposures to any potential issues arising from current or future audits of current and prior years' tax returns. Accordingly, the Company must assess such potential exposures and, where necessary, provide for any expected loss. The Company would recognize the benefit of a tax position if it is more likely than not to be sustained. Recognized tax positions are measured at the largest amount more likely than not to be realized upon settlement. To the extent that the Company establishes a liability, its income tax expense would be increased. If the Company ultimately determines that payment of these amounts is unnecessary, it would reverse the liability and recognize an income tax benefit during the period in which new information becomes available indicating that the liability is no longer necessary. The Company would record an additional income tax expense in the period in which new information becomes

available indicating that the income tax liability is greater than its original estimate. The Company did not record such an adjustment for the years ended December 31, 2020, 2021 or 2022.

Share-based compensation

The Company accounts for share-based compensation in accordance with the guidance in ASC 718, *Share-based Payments*, by measuring and recognizing compensation expense for all share-based payments based on estimated grant date fair values for equity settled awards.

Awards are granted under the 2019 Share Incentive Plan. The 2019 Share Incentive Plan provides for the grant of incentive share options, nonqualified share options, share appreciation rights, restricted share awards, restricted share units, or other share-based awards and performance awards.

The Company also issues shares under its Employee Share Purchase Plan ("ESPP"). The first offering period or purchase period under the ESPP began on January 1, 2021. Under the ESPP, the purchase price of the Company's shares is 85% of the lower of the fair market value of the shares on the first trading date of each offering period or on the purchase date.

Contingencies

In accordance with ASC 450, *Contingencies*, the Company periodically evaluates all pending or threatened contingencies and any commitments, if any, that are reasonably likely to have a material adverse effect on its results of operations, financial position or cash flows. Liabilities for loss contingencies arising from claims, assessments, litigation, fines, penalties and other sources are recorded when it is probable that a liability has been incurred and the amount can be reasonably estimated. Legal costs incurred in connection with loss contingencies are expensed as incurred.

Foreign currency translation

The Company records any gain and loss associated with foreign currencies in accordance with ASC 830, *Foreign Currency Matters*. The reporting currency of the Company is the U.S. dollar and the functional currency for each operating subsidiary is the local currency of the operating subsidiary other than for Cambium Networks, Ltd. (UK) for which the functional currency is the U.S. dollar. Local currency denominated monetary assets and liabilities are translated at exchange rates in effect at the balance sheet date, and revenues, cost of revenues and expenses are translated at the average exchange rate in effect during the applicable period. The Company recognizes foreign exchange gains and losses in other expense on its consolidated statements of operations and accumulated other comprehensive income (loss) on its consolidated balance sheets.

Research and development costs

Research and development expenses consists primarily of salary and benefit expenses for employees and contractors engaged in research, design and development activities, and costs for prototypes, travel costs and shared facility and IT costs. The Company also incurs research and development costs associated with the development of software for both internal use and to be marketed externally. Research and development costs, other than those associated with the development of software that meet the criteria for capitalization, are expensed as incurred.

Note 2. Balance sheet components

Receivables, net

The Company's accounts receivable arise from sales on credit to customers. The Company establishes an estimate for credit losses to present the net amount of accounts receivable expected to be collected. The estimate is determined by using the loss-rate method, which requires an estimation of loss rates based upon historical loss experience adjusted for factors that are relevant to determining the expected collectability of accounts receivables. Some of these factors include macroeconomic conditions that correlate with historical loss experience, delinquency trends, aging behavior of receivables and credit and liquidity indicators for individual customers.

The components of receivable, net are as follows (in thousands):

	December 31, 2021	December 31, 2022
Trade accounts receivable	$ 69,471	$ 89,758
Other receivables	985	140
Total receivables	70,456	89,898
Less: Allowance for credit losses	(683)	(577)
Receivables, net	$ 69,773	$ 89,321

The estimate for credit losses activity was as follows (in thousands):

	Year ended December 31, 2021	Year ended December 31, 2022
Beginning balance	$ 919	$ 683
Increase, charged to expense	172	93
Recoveries	(163)	(199)
Amounts written-off	(245)	—
Ending balance	$ 683	$ 577

Inventories, net

Inventories, net consisted of the following (in thousands):

	December 31, 2021	December 31, 2022
Finished goods	$ 31,991	$ 50,052
Raw materials	7,353	15,010
Gross inventory	39,344	65,062
Less: Excess and obsolete provision	(5,567)	(7,994)
Inventories, net	$ 33,777	$ 57,068

The following table reflects the activity in the Company's inventory excess and obsolete provision (in thousands):

	Year ended December 31, 2021	Year ended December 31, 2022
Beginning balance	$ 5,855	$ 5,567
Inventory written off	(468)	(1,316)
Increase in excess and obsolete provision	180	3,743
Ending balance	$ 5,567	$ 7,994

Accrued liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31, 2021	December 31, 2022
Accrued goods and services	$ 12,278	$ 10,633
Accrued inventory purchases	2,218	3,189
Accrued customer rebates	7,355	13,797
Other	97	423
Accrued liabilities	$ 21,948	$ 28,042

Accrued warranty

Provision for warranty claims is primarily related to our hardware products and recorded at the time products are sold. The change to accrued warranty was as follows (in thousands):

	Year ended December 31, 2021	Year ended December 31, 2022
Beginning balance	$ 1,714	$ 1,731
Fulfillment of assumed acquisition warranty	(216)	(142)
Provision increase, net	233	62
Ending balance	$ 1,731	$ 1,651

At December 31, 2021, $1.2 million is included in Other current liabilities and $0.5 million is included in Other noncurrent liabilities on the Company's consolidated balance sheet. At December 31, 2022, $1.2 million is included in Other current liabilities and $0.5 million is included in Other noncurrent liabilities on the Company's consolidated balance sheet.

Note 3. Property and equipment

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

	Useful Life	December 31, 2021	December 31, 2022
Equipment and tooling	3 to 5 years	$ 29,621	$ 33,026
Computer equipment	3 to 5 years	3,835	4,572
Furniture and fixtures	10 years	844	809
Leasehold improvements	2 to 3 years	457	472
Total cost		34,757	38,879
Less: Accumulated depreciation		(24,267)	(27,608)
Property and equipment, net		$ 10,490	$ 11,271

Total depreciation expense was $3.7 million, $3.4 million and $3.9 million for the years ended December 31, 2020, 2021 and 2022, respectively.

Note 4. Software

Software consisted of the following (in thousands):

	Useful Life	December 31, 2021 Gross carrying amount	December 31, 2021 Accumulated amortization	December 31, 2021 Net balance	December 31, 2022 Gross carrying amount	December 31, 2022 Accumulated amortization	December 31, 2022 Net balance
Acquired and Software for internal use	3 to7 years	$ 15,855	$ (14,907)	$ 948	$ 15,995	$ (15,326)	$ 669
Software marketed for external sale	3 years	7,164	(2,245)	4,919	11,650	(3,880)	7,770
Total		$ 23,019	$ (17,152)	$ 5,867	$ 27,645	$ (19,206)	$ 8,439

Amortization of acquired and internal use software is computed using the straight-line method over an estimated useful life of generally three to seven years. Amortization expense recognized on acquired and internal use software is reflected in depreciation and amortization in the consolidated statements of operations. Amortization expense was $0.8 million, $0.7 million and $0.4 million for the years ended December 31, 2020, 2021 and 2022, respectively.

Amortization expense recognized on software to be sold or marketed externally was $0.6 million, $0.8 million and $1.6 million for the years ended December 31, 2020, 2021 and 2022, respectively, and is included in cost of revenues on the consolidated statements of operations.

Based on capitalized software assets at December 31, 2022, estimated amortization expense in future fiscal years is as follows (in thousands):

Year ending December 31,	Acquired and internal use software	Software marketed for external use	Total
2023	286	2,934	3,220
2024	170	2,769	2,939
2025	120	1,750	1,870
2026	87	317	404
2027	6	—	6
Thereafter	—	—	—
Total amortization	$ 669	$ 7,770	$ 8,439

Note 5. Goodwill and Intangible Assets

When the Company acquired the trade assets of Motorola Solutions, Inc.'s wireless point-to-point and point-to-multi-point businesses, the transaction generated goodwill and certain intangible assets. The goodwill associated with this transaction was recorded by Cambium Networks Corporation and allocated to Cambium Networks, Ltd. and Cambium Networks, Inc. using a revenue and asset allocation method. Although goodwill has been allocated to two operating subsidiaries, the Company operates as one operating segment and one reporting unit and therefore, goodwill is reported, and impairment testing performed, at the Cambium Networks Corporation consolidated level.

The carrying amount of goodwill for the years ended December 31, 2021 and 2022 was $9.8 million. The was no change in the carrying amount of goodwill for the years ended December 31, 2021 and 2022.

The Company tests goodwill and intangible assets for impairment annually on December 31 and more frequently if impairment indicators exist. For 2021 and 2022, the Company performed qualitative assessments of significant events and circumstances such as a reporting unit's historical and current results, assumptions regarding future performance, strategic initiatives and overall economic factors, including the impact of the current global outbreak of COVID-19 and macro-economic developments, to determine the existence of potential indicators of impairment and assess if it is more likely than not that the fair value of the reporting unit or intangible asset is less than their carrying value. If indicators of impairment are identified, a quantitative impairment test is performed.

The qualitative assessments for 2021 and 2022 included our assessment of supply chain constraints, COVID-19, and macroeconomic considerations. Based on the operating results for 2021 and 2022 and these other considerations, the Company believes that it is more likely than not that the enterprise value for its one reporting unit and the fair value of intangibles is still greater than their carrying values. Accordingly, there was no goodwill impairment to record for either period. In addition, there were no triggering events or changes in circumstances during 2021 and 2022 that would have required an interim impairment assessment other than at the annual test date.

The useful life, gross carrying value, accumulated amortization, and net balance for each major class of definite-lived intangible assets at each balance sheet date were as follows (in thousands):

		December 31, 2021			December 31, 2022		
	Useful Life	Gross carrying amount	Accumulated amortization	Net balance	Gross carrying amount	Accumulated amortization	Net balance
Unpatented technology	3 - 7 years	$ 14,660	$ (14,555)	$ 105	$ 14,660	$ (14,660)	$ —
Customer relationships	5 - 18 years	19,300	(8,628)	10,672	19,300	(10,127)	9,173
Patents	7 years	11,300	(11,300)	—	11,300	(11,300)	—
Trademarks	10 years	5,270	(5,270)	—	5,270	(5,270)	—
Total		$ 50,530	$ (39,753)	$ 10,777	$ 50,530	$ (41,357)	$ 9,173

Intangible assets are amortized over their expected useful life and none are expected to have a significant residual value at the end of their useful life. Intangible assets amortization expense was $2.2 million, $2.1 million and $1.6 million for the years ended December 31, 2020, 2021 and 2022, respectively.

Based on capitalized intangible assets as of December 31, 2022, estimated amortization expense amounts in future fiscal years are as follows (in thousands):

Year ending December 31,	Amortization
2023	1,498
2024	1,498
2025	1,498
2026	1,498
2027	1,498
Thereafter	1,683
Total amortization	$ 9,173

Note 6. Debt

As of December 31, 2022, the Company had $28.0 million outstanding under its current term loan facility with Bank of America and $0.0 million in borrowings under its revolving credit facility. The Company has available $45.0 million under its revolving credit facility with Bank of America.

As of December 31, 2021, the Company had $30.0 million outstanding under its term loan facility with Bank of America and $0.0 million in borrowings under its revolving credit facility with Bank of America.

The following table reflects the current and noncurrent portions of the external debt facilities at December 31, 2021 and December 31, 2022 (in thousands):

	December 31, 2021	December 31, 2022
Term loan facility	$ 30,000	$ 28,031
Less debt issuance costs	(546)	(410)
Total debt	29,454	27,621
Less current portion of term facility	(2,625)	(3,281)
Current portion of debt issuance costs	136	123
Total long-term external debt, net	$ 26,965	$ 24,463

Secured credit agreements

On November 17, 2021 ("Closing Date"), Cambium Networks entered into a credit agreement (the “BofA Credit Agreement") among Cambium Networks, Ltd. as the borrower (the “Borrower”), Cambium Networks Corporation as Holdings and a Guarantor (“Holdings”), Cambium (US), L.L.C., as Intermediate Holdings and a Guarantor, certain other subsidiaries of Holdings party thereto as Guarantors (with the Borrower and each Guarantor being, individually, a “Loan Party” and collectively, the “Loan Parties”), Bank of America, N.A., as Administrative Agent (in such capacity, the “Administrative Agent”), a Lender, Swingline Lender and an L/C Issuer, the other Lenders party thereto from time to time and Bank of America, N.A. as Sole Lead Arranger and Sole Bookrunner.

The BofA Credit Agreement provides for loans and other financial accommodations to the Borrower in an aggregate principal amount of up to $75.0 million in the form of (i) a five-year term loan facility (the "Term Facility") in the amount of $30.0 million, all of which was drawn on the Closing Date to repay the outstanding balance under the existing credit facility with Silicon Valley Bank and (ii) a five-year revolving credit facility (the "Revolving Facility" and together with the Term Facility, the "Credit Facilities") in the amount of $45.0 million, including a $5.0 million sublimit for the issuance of letters of credit and a $5.0 million sublimit for Swingline Loans. The Credit Facilities were made available (a) to repay existing outstanding indebtedness under the existing credit facilities with Silicon Valley Bank, (b) to pay fees and expenses incurred in connection with the transactions contemplated by the BofA Credit Agreement and (c) for working capital requirements and other general corporate purposes of the Loan Parties and their subsidiaries.

The Term Facility and the Revolving Facility terminate on the date that is five (5) years after the Closing Date (the "Maturity Date").

The Borrower has the option to borrow Term Loans under the Term Facility in the form of either Base Rate Loans or Eurodollar Rate Loans, as defined in the BofA Credit Agreement. The Term Facility borrowed on the Closing Date was borrowed as a Eurodollar Rate Loan with a six (6) month Interest Period. The outstanding principal amounts of the Term Facility bear interest for the applicable Interest Period at a rate per annum equal to the Eurodollar Rate (the rate equal to the London Interbank Offered Rate) for such Interest Period *plus* the Applicable Rate (which is 2.00% per annum for the first full fiscal quarter following the Closing Date and thereafter ranges from 1.75% to 2.25% per annum, depending on Holdings' Consolidated Leverage Ratio). If Holdings' Consolidated Leverage Ratio is less than 1.00:1.00, the Applicable Rate for the Term Facility will be 1.75%. If Holdings' Consolidated Leverage Ratio is greater than or equal to 1.00:1.00 but less than 2.00:1.00, the Applicable Rate for the Term Facility will be 2.00%. If Holdings' Consolidated Leverage Ratio is greater than or equal to 2.00:1.00, the Applicable Rate for the Term Facility will be 2.25%. Based on the Company's Consolidated Leverage Ratio at December 31, 2022, the applicable rate on the Term Facility was 1.75% and the effective interest rate on the Term Facility was 6.86%.

The Borrower has the option to borrow Revolving Loans under the Revolving Facility in the form of either Base Rate Loans or Eurodollar Rate Loans. The outstanding principal amounts of Eurodollar Rate Loans borrowed under the Revolving Facility bear interest at the same rates as described above for the Eurodollar Rate Loan under the Term Facility.

The outstanding principal amounts of the Credit Facilities that are borrowed as (or converted to) Base Rate Loans under the BofA Credit Agreement bear interest from the applicable Borrowing date at a rate per annum equal to the Base Rate (a fluctuating rate of interest per annum equal to the highest of (a) the Federal Funds Rate *plus* 0.50%, (b) the rate of interest in effect for such day as publicly announced from time to time by Bank of America as its "prime rate," and (c) the one (1) month Eurodollar Rate *plus* 1.75%) *plus* the Applicable Rate (which is 0.25% per annum for the first full fiscal quarter following the Closing Date and thereafter ranges from 0.00% to 0.50% per annum, depending on Holdings' Consolidated Leverage Ratio). If Holdings' Consolidated Leverage Ratio is less than 1.00:1.00, the Applicable Rate for Base Rate Loans under the Revolving Facility will be 0.00%. If Holdings' Consolidated Leverage Ratio is greater than or equal to 1.00:1.00 but less than 2.00:1.00, the Applicable Rate for Base Rate Loans under the Revolving Facility will be 0.25%. If Holdings' Consolidated Leverage Ratio is greater than or equal to 2.00:1.00, the Applicable Rate for Base Rate Loans under the Revolving Facility will be 0.50%. The Borrower will pay an undrawn commitment fee ranging from 0.20% to 0.25% (depending on Holdings' Consolidated Leverage Ratio) on the unused portion of the Revolving Facility.

Obligations under the BofA Credit Agreement are guaranteed by Holdings and its material Subsidiaries pursuant to the BofA Credit Agreement. To secure the obligations of the Loan Parties under the Credit Facilities, each Loan Party has entered into a Security and Pledge Agreement (the "Security Agreement"), dated as of November 17, 2021, pursuant to which the applicable Grantors granted to the Administrative Agent, for the benefit of the Lenders and the other Secured Parties, a valid and perfected first priority lien and security interest, subject to customary exceptions, in (i) equity interests of the Domestic Loan Parties, and (ii) substantially all tangible and intangible personal property of the Domestic Loan Parties (unless and until certain Events of Default have occurred and are continuing, at which time the Administrative Agent may require a Foreign Loan Party to provide a valid and perfected security interest in substantially all of its tangible and intangible assets subject to certain customary exceptions), and all proceeds and products of the property and assets described above.

In addition to the liens granted under the Security Agreement, Cambium (US), L.L.C. entered into a Share Charge, as chargor (the "Chargor") dated November 17, 2021 (the "Share Charge") with Bank of America, as Collateral Agent for itself and for the Secured Parties (the "Collateral Agent"), pursuant to which the Chargor pledged to the Collateral Agent the shares of the Borrower.

The BofA Credit Agreement contains certain representations and warranties, certain affirmative covenants, certain negative covenants, certain financial covenants and certain conditions that are customarily required for similar financings. These covenants include, among others:

- A restriction on creating or assuming certain liens;
- A restriction on creating, incurring or assuming additional indebtedness, subject to specified permitted debt;
- A restriction on making or holding certain investments, subject to certain exceptions;

- A restriction on mergers, liquidations, consolidations and other fundamental changes, subject to specified exceptions;
- A restriction on certain sales and other dispositions of property or assets, including sale and leaseback transactions, subject to certain conditions and exceptions;
- A restriction on payments of dividends, share repurchases and other distributions, subject to certain exceptions; and
- A restriction on entering into certain transactions with affiliates.

In addition, Holdings may not permit its consolidated leverage ratio to exceed 2.75:1.00, and must maintain a minimum consolidated fixed charge coverage ratio of not less than 1.25:1.00. Determination of compliance with the consolidated leverage ratio commenced as of December 31, 2021 and compliance with the consolidated fixed charge coverage ratio commenced as of March 31, 2022. Based on the above covenants in the BofA Agreement, the Company believes that all covenants will be met at subsequent testing dates for the next twelve months and has classified the amounts due in excess of twelve months as noncurrent. As of December 31, 2022, the Company was in compliance with both its consolidated leverage ratio and fixed charge coverage ratio.

The BofA Credit Agreement also contains customary Events of Default that include, among others, non-payment of principal, interest or fees, violations of certain covenants, inaccuracy of representations and warranties, bankruptcy and insolvency events, material judgments, cross defaults to material indebtedness and events constituting a change of control. The occurrence and continuance of an Event of Default could result in the termination of commitments under the Credit Facilities and the declaration that all outstanding loans are immediately due and payable in whole or in part.

Maturities on the external debt outstanding at December 31, 2022 under the BofA Agreement are as follows (in thousands):

Year ending December 31,	
2023	2,625
2024	2,625
2025	2,625
2026	19,500
Total	$ 27,375

Interest expense, net

Net Interest expense, including bank charges and amortization of debt issuance costs on the external debt, was $5.3 million, $4.3 million and $2.0 million for the years ended December 31, 2020, 2021 and 2022, respectively. Interest expense for the year ended December 31, 2021 included $0.7 million of additional amortization of deferred issuance costs related to the Silicon Valley Bank credit agreement.

Expected discontinuation of LIBOR

In July 2017, the United Kingdom's Financial Conduct Authority ("FCA"), which regulates LIBOR, announced it will no longer compel banks to submit rates for the calculation of LIBOR after 2021 and in March 2021, confirmed the dates each tenor would cease. The 1-week and 2-month US Dollar LIBOR tenors ceased on December 31, 2021 and the remaining five US Dollar tenors (overnight, 1-month, 3-month, 6-month and 12-month) will cease on June 30, 2023. The BofA Credit Agreement matures on November 17, 2026, which is after the cessation of all tenors of the US Dollar LIBOR rate.

The Company is evaluating the potential impact of the transition from LIBOR as an interest rate benchmark to other potential alternative reference rates, including SOFR. Eurodollar loans under the BofA Credit Agreement are currently indexed to Eurodollar Rate (the rate equal to the London Interbank Offered Rate). The BofA Credit Agreement contemplates the discontinuation of LIBOR and provides that a benchmark replacement rate shall be determined by reference to other applicable rates and additionally allows the Company to switch to a Base Rate loan, as defined in the BofA Credit Agreement. The Company will continue to actively assess the related opportunities and risks involved in this transition.

Note 7. Employee benefit plans

The Company's employee benefit plans currently consist of a defined contribution plan in the United States and a separate defined contribution plan in the UK. The Company does not offer any other postretirement benefit plans, such as retiree medical and dental benefits or deferred compensation agreements to its employees or officers.

U.S. plan

U.S. regular, full-time employees are eligible to participate in the Cambium Networks, Inc. 401(k) Plan, which is a qualified defined contribution plan under section 401(k) of the Internal Revenue Service Code. Under the Cambium Networks, Inc. 401(k) Plan, the Company contributes a dollar-for-dollar match of the first 4% an employee contributes to the plan. Employees are eligible to participate on the first day of the month following their date of hire and begin receiving company contributions three-months after they become eligible to participate in the plan. Company matching contributions are made each pay period, but the funds do not vest until the employee's second anniversary of employment with the Company. Employees are always fully vested in their own contributions. All contributions, including the Company match, are made in cash and invested in accordance with the participants' investment elections. Contributions made by the Company under the Cambium Networks, Inc. 401(k) Plan were $1.0 million, $1.2 million and $1.4 million for the years ended December 31, 2020, 2021 and 2022, respectively.

UK plan

Regular, full-time UK employees are eligible to participate in the Cambium Networks Ltd. Stakeholder Pension Scheme, which is a qualified defined contribution plan. Employees are eligible to participate on the first of the month following receipt of their enrollment form, and eligible employees are automatically enrolled in the plan at a default employee contribution rate of 3% and a company contribution rate of 5% of the employee's basic salary. The Company contribution rate increases by 1% for each additional 1% that the employee contributes up to a maximum of 7%. Company matching contributions vest immediately and employees are always vested in their own contributions. All contributions, including the Company match, are made in cash and deposited in the participant's account each pay period. The total contributed by the Company under this plan was $0.4 million, $0.4 million and $0.4 million for the years ended December 31, 2020, 2021 and 2022, respectively.

Note 8. Other expense (income), net

Other expense (income), net was expense of $0.5 million, $0.2 million and income of $(0.1) million for the years ended December 31, 2020, 2021 and 2022, respectively, and represents foreign exchange losses.

Note 9. Share-based compensation

2019 Share incentive plan

In June 2019, the Company's Board of Directors adopted, and its shareholders approved, the 2019 Share Incentive Plan ("2019 Plan"). The 2019 Plan provides for the grant of incentive share options, nonqualified share options, share appreciation rights, restricted share awards ("RSAs"), restricted share units ("RSUs"), other share-based awards and performance awards. The share reserve under the 2019 Plan will be automatically increased on the first day of each fiscal year, beginning with the fiscal year ending December 31, 2020 and will continue until, and including, the fiscal year ending December 31, 2029. The number of shares added annually will be equal to the lowest of 1,320,000 shares, 5% of the number of the Company's shares outstanding on the first day of such fiscal year, or an amount determined by the Board of Directors. On February 25, 2022 the Company registered 1,320,000 additional shares that may be issued under the 2019 Plan.

The Company's employees, officers, directors, consultants, and advisors are eligible to receive awards under the 2019 Plan. Incentive share options, however, may only be granted to its employees.

The following table summarizes changes in the number of shares available for grant under the Company's equity incentive plans during the year ended December 31, 2022:

	Number of shares
Available for grant at December 31, 2021	1,853,240
Added to 2019 Share Incentive Plan	1,320,000
RSUs granted	(418,896)
Options granted	(963,000)
Shares withheld in settlement of taxes and/or exercise price	52,554
Expirations	8,799
Forfeitures	147,667
Available for grant at December 31, 2022	2,000,364

As of December 31, 2022, the Company estimates the pre-tax unrecognized compensation expense of $22.7 million related to all unvested share-based awards, including share options and restricted share units will be recognized through the fourth quarter of 2026. The Company expects to satisfy the exercise of share options and future distributions of shares for restricted share units and restricted share awards by issuing new ordinary shares which have been reserved under the 2019 Plan.

The Company uses the Black-Scholes option pricing model to estimate the fair value of share options. The Company utilized a forfeiture rate of 8.2% during the year ended December 31, 2022 for estimating the forfeitures of share options and restricted share units granted.

Share options

Share options typically have a contractual term of ten years from grant date. The following is a summary of option activity for the Company's share incentive plans for year ended December 31, 2022:

	Options	Weighted average exercise price	Weighted Average remaining contractual term (years)	Aggregate intrinsic value
Outstanding at December 31, 2021	2,797,992	$ 12.64	7.9	$ 38,295,799
Options granted	963,000	$ 15.61	—	$ —
Options exercised	(242,423)	$ 9.21	—	$ —
Options expired	(8,799)	$ 14.77	—	$ —
Options forfeited	(114,551)	$ 9.64	—	$ —
Outstanding at December 31, 2022	3,395,219	$ 13.83	7.6	$ 28,985,969
Options exercisable at December 31, 2022	1,807,566	$ 12.45	6.8	$ 17,697,417
Options vested and expected to vest at December 31, 2022	3,337,698	$ 13.81	7.6	$ 28,535,242

The intrinsic value for share options outstanding and exercisable is defined as the difference between the market value of the Company's ordinary shares as of the end of the period and the grant price. At December 31, 2020, 2021 and 2022, the aggregate intrinsic value of options exercisable under the Company's share incentive plans was $12.7 million, $18.5 million and $17.7 million, respectively, as determined as of the date of grant. No share options were exercised prior to 2020. The Company had 138,878,

454,354 and 242,423 options exercised during the years ended December 31, 2020, 2021 and 2022, respectively. The cash received from the share options exercised in 2020, 2021 and 2022 was $1.6 million, $4.8 million and $2.2 million, respectively.

At December 31, 2022, there was $12.1 million in unrecognized pre-tax share-based compensation expense, net of estimated forfeitures, related to unvested share option awards. The unrecognized share-based compensation expense is expected to be recognized over a weighted-average period of 2.8 years.

The Company estimates the fair value of share options using the Black-Scholes option pricing model. The fair value of share options is being amortized on a straight-line basis over the requisite service period of the awards. The fair value of share options is estimated using the following weighted-average assumptions:

	Year Ended December 31,		
	2020	2021	2022
Expected dividend yield	—	—	—
Risk-free interest rate	0.39%	1.14%	2.96%
Weighted-average expected volatility	50.0%	50.9%	72.9%
Expected term (in years)	6.5	6.5	5.5
Weighted average grant-date fair value per share of options granted	$ 7.56	$ 21.36	$ 9.94

Restricted shares

The following is a summary of restricted shares activity for the Company's share incentive plans for the year ended December 31, 2022:

	Units	Weighted average grant date fair value
RSU balance at December 31, 2021	547,343	$ 22.47
RSUs granted	418,896	$ 15.31
RSUs vested	(236,133)	$ 22.05
RSUs forfeited	(33,116)	$ 24.47
RSU balance at December 31, 2022	696,990	$ 18.22

During 2021 and 2022, 267,175 and 418,896 RSUs were granted under the 2019 Plan, respectively. The Company withheld 64,761 and 52,554 shares to pay the employees' portion of the minimum payroll withholding taxes on the RSUs and RSAs that vested in 2021 and 2022, respectively.

At December 31, 2022, there was $10.6 million in unrecognized pre-tax compensation expense, net of estimated forfeitures, related to unvested share awards. The unrecognized compensation expense is expected to be recognized over a weighted average period of 2.7 years.

Employee share purchase plan

In June 2019, the Company's Board of Directors adopted, and its shareholders approved, the Employee Share Purchase Plan ("ESPP"). The ESPP was effective on June 25, 2019 and the offering period or purchase period under the ESPP began on January 1, 2021. A total of 1,334,427 shares are available under the ESPP, which includes 550,000 shares originally available, 256,730 additional shares registered on March 24, 2020, 260,345 additional shares registered on March 1, 2021 and 267,352 additional shares registered on February 25, 2022. The number of shares that will be available for sale under the ESPP will be increased annually on the first day of each fiscal year beginning in 2020, and will be equal to the lowest of: 275,000 shares; 1% of the outstanding shares as of the last day of the immediately preceding fiscal year, or such other amount as the administrator may determine. The purchase price of the shares will be 85% of the lower of the fair market value of our shares on the first trading day of each offering period or on the purchase date.

For the year ended December 31, 2021, the Company recognized $0.7 million of share-based compensation expense related to the ESPP. There were 39,061 and 42,401 shares issued under the ESPP during the six-month offering periods that ended on June 30, 2021 and December 31, 2021, respectively. For the year ended December 31, 2022, the Company recognized $0.9 million of share-based compensation expense related to the ESPP. There were 87,229 and 64,867 shares issued under the ESPP during the six-month offering periods that ended on June 30, 2022 and December 31, 2022, respectively.

Note 10. Share capital – shares

The following table reflects the share capital activity:

	Number of shares	Par value (in thousands)
Balance at December 31, 2021	26,735,175	$ 3
Issuance of ordinary shares under employee share purchase plan	152,096	—
Issuance of vested shares	236,133	—
Share options exercised	242,423	—
Shares withheld for net settlement of shares issued	(52,554)	—
Balance at December 31, 2022	27,313,273	$ 3

As of December 31, 2022, no dividends have been declared or paid.

Note 11. Earnings per share

Basic net earnings per share is computed by dividing net income by the weighted-average number of shares outstanding during the period. Diluted net earnings per share is computed by giving effect to all potentially dilutive ordinary share equivalents outstanding for the period. For purposes of this calculation, share options, RSUs, and RSAs are considered to be ordinary share equivalents but are excluded from the calculation of diluted earnings (loss) per share when including them would have an anti-dilutive effect. The following table sets forth the computation of basic and diluted net earnings per share (in thousands, except for share and per share data):

	Year Ended December 31,		
	2020	2021	2022
Numerator:			
Net income	$ 18,575	$ 37,421	$ 20,200
Denominator:			
Basic weighted average shares outstanding	25,707,092	26,421,087	26,919,550
Dilutive effect of share option awards	228,388	1,846,998	851,011
Dilutive effect of restricted share units and restricted share awards	467,632	348,934	242,528
Dilutive effect of employee share purchase plan	—	11,117	12,189
Diluted weighted average shares outstanding	26,403,112	28,628,136	28,025,278
Net earnings per share, basic	$ 0.72	$ 1.42	$ 0.75
Net earnings per share, diluted	$ 0.70	$ 1.31	$ 0.72

In the computation of diluted earnings per share for the year ended December 31, 2020, 2,082 ordinary share equivalents were excluded because their inclusion would have been antidilutive. In the computation of diluted earnings per share for the year ended December 31, 2021, no ordinary share equivalents were excluded. In the computation of diluted earnings per share for the year ended December 31, 2022, 1,361,666 ordinary share equivalents were excluded because their inclusion would have been antidilutive.

Note 12. Income taxes

For the years ended December 31, 2020, 2021 and 2022, income before income taxes includes the following components (in thousands):

	Years ended December 31,		
	2020	2021	2022
United States	$ 2,648	$ 10,943	$ 10,269
Foreign	15,483	20,963	7,748
Total	$ 18,131	$ 31,906	$ 18,017

For the years ended December 31, 2020, 2021 and 2022, the benefit for income taxes consists of the following (in thousands):

	Years ended December 31,		
	2020	2021	2022
Current:			
U.S. federal	$ (198)	$ 268	$ 1,174
State	(181)	(94)	847
Foreign	1,007	376	985
Current tax provision	628	550	3,006
Deferred:			
U.S. federal	$ (664)	$ (1,662)	$ (3,814)
State	(144)	(147)	(610)
Foreign	(264)	(4,256)	(765)
Deferred tax benefit	(1,072)	(6,065)	(5,189)
Benefit for income taxes	$ (444)	$ (5,515)	$ (2,183)

In applying the statutory tax rate in the effective income tax rate reconciliation, the Company used the statutory U.S. federal income tax rate of 21% rather than the Cayman Islands zero percent rate. The table below reconciles the Company's tax provision based on the statutory U.S. federal income tax rate to its effective tax rate for the years ended December 31, 2020, 2021 and 2022 (in thousands):

	Years ended December 31,		
	2020	2021	2022
Income tax expense at federal statutory rate	$ 3,808	$ 6,700	$ 3,784
State and local income taxes net of federal benefit	(295)	10	27
Tax rate changes	(925)	21	(873)
Valuation allowance changes	(1,226)	(7,902)	857
Foreign rate differential	(181)	(164)	138
Research and development	(1,455)	(811)	(2,840)
Share-based compensation - excess tax benefit	(171)	(3,444)	(778)
Foreign derived intangible income	(349)	—	(2,258)
Other	350	75	(240)
Benefit for income taxes	$ (444)	$ (5,515)	$ (2,183)

Foreign rate differential represents the non-U.S. jurisdictions. The country having the greatest impact on the tax rate adjustment line shown in the above table as “foreign rate differential” for the years ended December 31, 2020, 2021 and 2022 is the UK where the statutory income tax rate was 19.0% for 2020, 2021 and 2022.

The deferred tax assets and liabilities result from differences in the timing of the recognition of certain income and expense items for tax and financial reporting purposes.

The sources of these differences for the years ended December 31, 2021 and 2022 are as follows (in thousands):

	Years ended December 31,	
	2021	2022
NOL and tax credit carryforwards	$ 6,886	$ 5,883
Capitalized research costs	—	6,017
Disallowed interest carryforwards	909	906
Lease liability	584	289
Property and equipment	27	—
Share-based compensation	1,130	2,665
Intangible assets	221	260
Other	353	320
Subtotal	10,110	16,340
Less: Valuation allowance	(471)	(1,328)
Net deferred tax assets	9,639	15,012
Property and equipment	—	(775)
Operating lease assets	(505)	(242)
Prepaid expenses and other assets	(400)	(425)
Capitalized software development costs	(1,141)	(788)
Net deferred tax liabilities	(2,046)	(2,230)
Total deferred tax assets, net	$ 7,593	$ 12,782

Deferred tax assets/liabilities included in the balance sheet are:

	Years ended December 31,	
	2021	2022
Deferred tax assets - non-current	$ 7,604	$ 12,782
Deferred tax liabilities - non-current	11	—
Total deferred tax assets, net	$ 7,593	$ 12,782

For the years ended December 31, 2021 and 2022, the following table reflects the activity in the Company's valuation allowance on deferred tax assets (in thousands):

	Years ended December 31,	
	2021	2022
Beginning balance	$ 8,373	$ 471
(Release) increase of valuation allowance	(7,902)	857
Ending balance	$ 471	$ 1,328

In assessing the realizability of deferred tax assets, the Company considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the period in which those temporary differences become deductible. The Company considers projected future taxable income, reversing taxable temporary differences, carryback opportunities, and tax-planning strategies in making this assessment.

Management assesses the available positive and negative evidence to estimate if sufficient future taxable income will be generated to utilize the existing deferred tax assets before they otherwise expire. Cumulative losses are objective evidence that limit the ability to consider other subjective evidence such as the Company's projections for future growth. 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 may be given to subjective evidence such as the Company's projections for growth.

As of December 31, 2021 the Company's deferred tax assets were primarily the result of UK and U.S. net operating losses ("NOLs"), tax credit carryforwards from the UK and U.S., share-based compensation, and the UK corporate interest restriction. As of December 31, 2022, the Company's deferred tax assets were primarily the result of capitalized research costs, UK net operating losses, tax credit carryforwards from the UK and U.S., share-based compensation, and UK corporate interest restriction.

For the year ended December 31, 2021, the Company recorded a net decrease in its valuation allowance of $7.7 million, related to the deferred tax assets (NOL and research and development credits) of the UK Company. In 2021, management concluded that all of the valuation allowance on the Company's UK entity's deferred tax assets was no longer needed. This was primarily due to a 12-quarter cumulative income through the first quarter of 2021 and the forecast of future taxable income. As of December 31, 2021, based on the evaluation of positive and negative evidence, the Company believes it is more likely than not that the net deferred tax assets will be realized by its UK entity. Accordingly, management has recognized a non-recurring tax benefit of $7.7 million related to the reversal of this valuation allowance.

For the year ended December 31, 2022, the Company recorded an increase in its valuation allowance of $0.8 million related to the deferred tax assets (California research and development credits) of the U.S. Company.

During 2022, the Company added state research and development tax credit benefits in the state of California, which are only available to offset actual tax liabilities. The state research and development tax credits are in excess of the amount reasonably expected to be utilized over the next five years. Accordingly, the Company established an additional $0.8 million of valuation allowance during 2022, for a total of $1.3 million valuation allowance on the related deferred tax asset at December 31, 2022. During 2021, the Company's valuation allowance on the research and development tax credits for the state of California decreased $0.2 million and was $0.5 million at December 31, 2021.

The Company reviews the likelihood that it will realize the benefit of its deferred tax assets and therefore, the need for a valuation allowance on a quarterly basis. Regarding the valuation allowance remaining on the research and development tax credits for the state of California, the Company may release all or a portion of its valuation allowance, if results and other subjective evidence continue to reflect pre tax income such that the deferred tax assets become more likely than not to be realizable.

The Company has gross income tax NOL carryforwards related to its U.S. and international operations. For the year ended December 31, 2021, the NOL carryforward was approximately $28.7 million, of which $25.6 million has an indefinite life and $3.1 million had a life greater than 10 years. For the year ended December 31, 2022, the NOL carryforward was approximately $17.0 million, of which $15.3 million has an indefinite life and $1.7 million has a life greater than 10 years. The Company’s gross NOL carryforwards expire as follows:

	Years ended December 31,	
	2021	2022
Unlimited carryforward	$25.6 million	$15.3 million
10+ year carryforward	$3.1 million	$1.7 million

The Company has tax credit carryforwards related to research and development. For the year ended December 31, 2021, the carryforward was approximately $1.5 million, of which $0.7 million had an indefinite life and $0.8 million had a life of greater than 10 years. For the year ended December 31, 2022, the carryforward was approximately $2.0 million, all of which has an indefinite life. The Company’s research and development tax credit carryforwards and their expiration are as follows:

	Years ended December 31,	
	2021	2022
Unlimited carryforward	$0.7 million	$2.0 million
10+ year carryforward	$0.8 million	—

The Company has gross corporate interest restriction (“CIR”) disallowance carryforwards related to its UK operations. For the year ended December 31, 2021, the CIR carryforward was approximately $4.8 million, all of which had an indefinite life. For the year ended December 31, 2022, the CIR carryforward was approximately $3.9 million, all which has an indefinite life. The Company has recorded a reduction to the deferred tax asset of $0.9 million related to utilization of a portion of the CIR as of December 31, 2022. The Company’s gross carryforwards expire as follows:

	Years ended December 31,	
	2021	2022
Unlimited carryforward	$4.8 million	$3.9 million

The Company files income tax returns in the U.S. federal jurisdiction, various state and local jurisdictions and many foreign jurisdictions. The U.S., UK, and India are the main taxing jurisdictions in which the Company operates. Open tax years subject to audit vary depending on the tax jurisdiction. In the U.S., the Company is no longer subject to U.S. federal income tax examinations by tax authorities for years before 2019. In the UK, the tax returns that are open are for the tax years 2020, 2021, and 2022. In India, the tax returns that are open are for India assessment years 2018 through 2022.

The Company believes its tax positions comply with applicable tax law and intends to vigorously defend its position. However, differing positions on certain issues could be upheld by tax authorities, which could adversely affect the Company’s financial condition and results of operations. The Company does not have any unrecognized tax positions as of December 31, 2021 and 2022.

The Company recorded income tax benefits of $0.4 million, $5.5 million, and $2.2 million for the years ended December 31, 2020, 2021 and 2022, with an effective tax rate of (2.4)%, (17.3)% and (12.1)%, respectively. The Company's effective tax rate of (2.4)% for the year ended December 31, 2020 differed from the U.S. statutory rate of 21.0% primarily due to a benefit on research and development credit, a benefit on the partial release of a valuation allowance, and a tax benefit due to the increase of the tax rate applied to UK deferred tax assets. For the year ended December 31, 2021, the Company's effective tax rate was (17.3)%. The effective tax rate differed from the U.S. statutory rate of 21.0% primarily due to a benefit on the release of a valuation allowance against its deferred tax assets of $7.9 million and a $3.4 million benefit arising on employee restricted share vesting and option exercises. For the year ended December 31, 2022, the Company's effective tax rate was (12.1)%. The effective tax rate differed from the U.S. statutory rate of 21.0% primarily due to research and development tax credits of $2.8 million, a benefit on Foreign Derived Intangible Income of $2.3 million, and a tax benefit of $0.9 million on revaluation of the UK deferred tax assets at a higher tax rate.

Note 13. Commitments and contingencies

In accordance with ASC 460, *Guarantees*, the Company recognizes the fair value for guarantee and indemnification arrangements it issues or modifies, if these arrangements are within the scope of the interpretation. In addition, the Company must continue to monitor the conditions that are subject to the guarantees and indemnifications in order to identify if a loss has incurred. If the Company determines it is probable that a loss has occurred, then any such estimated loss would be recognized under those guarantees and indemnifications and would be recognized in the Company's consolidated statements of operations and corresponding consolidated balance sheets during that period.

Indemnification

The Company generally indemnifies its distributors, value added reseller and network operators against claims brought by a third party to the extent any such claim alleges that the Company's product infringes a patent, copyright or trademark or violates any other proprietary rights of that third party. Although the Company generally tries to limit the maximum amount of potential future liability under its indemnification obligations, in certain agreements this liability may be unlimited. The maximum potential amount of future payments the Company may be required to make under these indemnification agreements is not estimable.

The Company indemnifies its directors and officers and select key employees, including key employees serving as directors or officers of the Company's subsidiaries, for certain events or occurrences, subject to certain limits, while the director or officer is or was serving at the Company's request in such capacity. The term of the indemnification period is for the director's or officer's term of service. The Company may terminate the indemnification agreements with its directors, officers or key employees upon the termination of their services as directors or officers of the Company or its subsidiaries, or the termination of activities for which indemnification has been provided, but termination will not affect claims for indemnification related to events occurring prior to the effective date of termination. The maximum amount of potential future indemnification is unlimited; however, the Company has a director and officer insurance policy that limits its exposure. The Company believes the fair value of these indemnification agreements is minimal.

Purchase commitments with contract manufacturers and suppliers

We purchase components from a variety of suppliers and use contract manufacturers to provide manufacturing services for our products. During the normal course of business, in order to manage manufacturing lead times and help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that allow them to procure inventory based upon criteria as defined by us, such as forecasted demand. The Company may be liable to purchase excess product or aged material from our suppliers following reasonable mitigation efforts.

Warranties

The Company offers a standard warranty on its products, with the term depending on the product, and records a liability for the estimated future costs associated with potential warranty claims. The Company's responsibility under its standard warranty is the repair or replacement of in-warranty defective product, or to credit the purchase price of the defective product, at its discretion, without charge to the customer. The Company's estimate of future warranty costs is largely based on historical experience factors including product failure rates, material usage, and service delivery cost incurred in correcting product failures. The standard warranty is included in either Other current liabilities or Other noncurrent liabilities on the Company's consolidated balance sheets, depending on the time period covered by the warranty. The Company also offers an extended warranty for purchase that represents a future performance obligation for the Company. The extended warranty is included in deferred revenues (both current and noncurrent) on the consolidated balance sheets and recognized on a straight-line basis over the term of the extended warranty. The warranty costs are reflected in the Company's consolidated statements of operations within cost of revenues.

Legal proceedings

Third parties may from time to time assert legal claims against the Company. The Company records accruals for loss contingencies to the extent that it concludes it is probable that a liability has been incurred and the amount of the related loss can be reasonably estimated. The Company evaluates, on a regular basis, developments in legal proceedings and other matters that could cause a change in amounts recorded. Due to the inherent uncertainty involving legal matters, the ultimate resolution could differ from amounts recorded. There is no pending or threatened legal proceedings to which the Company is a party to, and in the Company's opinion, is likely to have a material adverse effect on its financial condition or results of operations.

Note 14. Revenue from contracts with customers

Disaggregation of revenues

Revenues by product category were as follows (in thousands, except percentages):

	Year Ended December 31,					
	2020		2021		2022	
Point-to-Multi-Point	$ 172,601	62%	$ 204,756	61%	$ 114,941	39%
Point-to-Point	60,435	22%	60,761	18%	67,083	22%
Enterprise	39,990	14%	66,933	20%	109,844	37%
Other	5,433	2%	3,404	1%	5,031	2%
Total Revenues	$ 278,459	100%	$ 335,854	100%	$ 296,899	100%

The Company's products are predominately distributed through a third-party logistics provider in the United States, Netherlands and China. The Company has determined the geographical distribution of product revenues based upon the ship-to destinations.

Revenue by geography were as follows (in thousands, except percentages):

	Year Ended December 31,					
	2020		2021		2022	
North America	$ 147,328	53%	$ 173,491	52%	$ 133,897	45%
Europe, Middle East and Africa	80,927	29%	93,082	28%	90,883	31%
Caribbean and Latin America	29,418	11%	40,974	12%	31,223	10%
Asia Pacific	20,786	7%	28,307	8%	40,896	14%
Total Revenues	$ 278,459	100%	$ 335,854	100%	$ 296,899	100%

The following countries had revenues greater than 10% of total revenues:

- United States - $140.7 million for 2020, $165.3 million for 2021 and $132.9 million for 2022
- Italy - $31.6 million for 2020

Customers with an accounts receivable balance of 10% or greater of total accounts receivable and customers with net revenues of 10% or greater of total revenues are presented below for the periods indicated:

	Percentage of Revenues Years Ended December 31,			Percentage of Accounts Receivable As of December 31,	
	2020	2021	2022	2021	2022
Customer A	19%	20%	15%	25%	29%
Customer B	14%	15%	*	*	*

* denotes percentage is less than 10%

Contract Balances

The following table summarizes contract balances as of December 31, 2021 and December 31, 2022:

	December 31, 2021	December 31, 2022
Trade accounts receivable, net of allowance for credit losses	$ 68,788	$ 89,181
Deferred revenue - current	6,880	8,913
Deferred revenue - noncurrent	5,363	8,617
Refund liability	$ 2,516	$ 3,186

Trade accounts receivable include amounts currently due from customers. Amounts are in accordance with contractual terms and are recorded at face amount less an allowance for credit losses.

Deferred revenue consists of amounts due or received from customers in advance of the Company satisfying performance obligations under contractual arrangements. Deferred revenue is classified as current or noncurrent based on the timing of when revenue will be recognized. The changes in deferred revenue were due to normal timing differences between the Company's performance and the customers' payment.

The refund liability is the estimated amount expected to be refunded to customers in relation to product exchanges made as part of the Company's stock rotation program and returns that have been authorized, but not yet received by the Company. It is included within other current liabilities in the consolidated balance sheets.

Remaining performance obligations

Remaining performance obligations represent the revenue that is expected to be recognized in future periods related to performance obligations included in a contract that are unsatisfied, or partially satisfied, as of the end of a period. As of December 31, 2021 and 2022, deferred revenue (both current and noncurrent) of $12.2 million and $17.5 million, respectively, represents the Company's remaining performance obligations, of which $6.9 million and $8.9 million, respectively, is expected to be recognized within one year, with the remainder to be recognized thereafter.

Revenue recognized during the year ended December 31, 2022 which was previously included in deferred revenues as of December 31, 2021 was $6.8 million. Revenue recognized during the year ended December 31, 2021 which was previously included in deferred revenues as of December 31, 2020 was $6.3 million. Revenue recognized during the year ended December 31, 2020 which was previously included in deferred revenues as of December 31, 2019 was $7.3 million.

Cost to obtain a contract

Sales commissions are incremental costs of obtaining a contract. The Company has elected to recognize these expenses as incurred due to the amortization period of these costs being one year or less.

Note 15. Leases

The Company has operating leases for offices, vehicles, and office equipment. Leases with a term of 12 months or less are not recorded on the consolidated balance sheets, and are expensed on a straight-line basis over the lease term.

Right-of-use ("ROU") assets and operating lease liabilities are recognized based on the present value of the future minimum lease payments over the lease term at the commencement date. The Company's lease payments are typically fixed or contain fixed escalators. The Company's leases typically include certain lock-in periods and renewal options to extend the lease, but does not consider options to extend the lease it is not reasonably certain to exercise. The Company elected the practical expedient to not separate the lease and non-lease components of its leases and currently has no leases with options to purchase the leased property.

The components of lease expense were as follows (in thousands):

	Years Ended December 31,		
	2020	2021	2022
Operating lease cost	$ 2,586	$ 2,592	$ 2,361
Short-term lease cost	341	283	471
Variable lease costs	375	500	611
Total lease expense	$ 3,302	$ 3,375	$ 3,443

Supplemental balance sheet information related to leases were as follows (in thousands, except lease term and discount rate):

	Balance Sheet Caption	December 31, 2021	December 31, 2022
Operating leases:			
Operating lease assets	Operating lease assets	$ 5,899	$ 4,011
Current lease liabilities	Other current liabilities	$ 2,116	$ 1,930
Noncurrent lease liabilities	Noncurrent operating lease liabilities	$ 4,112	$ 2,170
Weighted average remaining lease term (years):			
Operating leases		3.35	2.67
Weighted average discount rate:			
Operating leases		6.15%	6.11%

Supplemental cash flow information related to leases were as follows (in thousands):

	Years Ended December 31,		
	2020	2021	2022
Supplemental cash flow information:			
Cash paid for amounts included in the measurement of lease liabilities	$ 2,701	$ 2,674	$ 2,403

The Company's current lease terms range from one to four years and may include options to extend the lease by one to four years.

Remaining maturities on lease liabilities at December 31, 2022 is as follows (in thousands):

	Operating leases
2023	2,122
2024	1,116
2025	806
2026	384
2027	—
Thereafter	—
Total lease payments	4,428
Less: interest	328
Present value of lease liabilities	$ 4,100

Note 16. Related party transactions

The Company follows ASC 850, *Related Party Disclosures*, for the identification of related parties and disclosure of related party transactions. A party is considered to be related to the Company if the party directly or indirectly or through one or more intermediaries, controls, is controlled by, or is under common control with the Company. Related parties also include principal owners of the Company, its management, members of the immediate families of principal owners of the Company and its management and other parties with which the Company may deal.

For the years ended December 31, 2020, 2021 and 2022, Vector Capital Management, LP charged $0.0 million, $0.0 million and $0.1 million for management advisory fees. Amounts due to Vector Capital Management, LP at December 31, 2021 and 2022 were $0.0 million and $0.1 million, respectively, and were included in Accounts Payable in the Company's consolidated balance sheets.

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