

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

Form 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 28, 2020

Or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____
Commission file number 0-31285

TTM TECHNOLOGIES, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
*(State or Other Jurisdiction of
Incorporation or Organization)*
200 East Sandpointe, Suite 400
Santa Ana, California
(Address of Principal Executive Offices)

91-1033443
*(I.R.S. Employer
Identification No.)*
92707
(Zip Code)

(714) 327-3000

(Registrant's telephone number, including area code)

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

<u>Title of each class</u>	<u>Trading symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, \$0.001 par value	TTMI	Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Exchange 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, a 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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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 control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

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

The aggregate market value of Common Stock held by non-affiliates of the registrant (based on the closing price of the registrant's Common Stock as reported on the Nasdaq Global Select Market on June 29, 2020, the last business day of the most recently completed second fiscal quarter), was \$1,142,137,689. For purposes of this computation, all officers, directors, and 10% beneficial owners of the registrant are deemed to be affiliates of the registrant. Such determination should not be deemed to be an admission that such officers, directors, or 10% beneficial owners are, in fact, affiliates of the registrant.

As of February 17, 2021, there were outstanding 106,770,572 shares of the registrant's Common Stock, \$0.001 par value.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for its 2021 Annual Meeting of Stockholders are incorporated by reference into Part III of this report. Such Proxy Statement will be filed with the Securities and Exchange Commission within 120 days after the end of the fiscal year to which this report relates.

TTM TECHNOLOGIES, INC.
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PART I

Statement Regarding Forward-Looking Statements

This report on Form 10-K contains forward-looking statements regarding future events or our future financial and operational performance. Forward-looking statements include statements regarding markets for our products; trends in net sales, gross profits and estimated expense levels; liquidity and anticipated cash needs and availability; and any statement that contains the words “anticipate,” “believe,” “plan,” “forecast,” “foresee,” “estimate,” “project,” “expect,” “seek,” “target,” “intend,” “goal” and other similar expressions. The forward-looking statements included in this report reflect our current expectations and beliefs, and we do not undertake publicly to update or revise these statements, even if experience or future changes make it clear that any projected results expressed in this annual report or future quarterly reports to stockholders, press releases or company statements will not be realized. In addition, the inclusion of any statement in this report does not constitute an admission by us that the events or circumstances described in such statement are material. Furthermore, we wish to caution and advise readers that these statements are based on assumptions that may not materialize and may involve risks and uncertainties, many of which are beyond our control, that could cause actual events or performance to differ materially from those contained or implied in these forward-looking statements. These risks and uncertainties include the business and economic risks described in “Item 1A — Risk Factors”.

Unless otherwise indicated or unless the context requires otherwise, all references to time periods refer to our fiscal year, and all reference to “TTM,” “our company,” “we,” “us,” “our,” and similar names refer to TTM Technologies, Inc. and its subsidiaries.

ITEM 1. BUSINESS

General

We are a leading global printed circuit board (PCB) manufacturer, focusing on quick-turn and volume production of technologically advanced PCBs and backplane assemblies as well as a global designer and manufacturer of high-frequency radio frequency (RF) and microwave components and assemblies. According to a November 2020 report by Prismark Partners, we are one of the largest PCB manufacturers in the world based on 2019 revenue. Taking into account strategic divestitures the Company carried out in 2020, on a pro-forma basis, we generated approximately \$2.0 billion in net sales and ended the year with approximately 16,700 employees worldwide. We currently operate a total of 24 specialized facilities in North America and China. We focus on providing time-to-market and volume production of advanced technology products and offer a one-stop design, engineering and manufacturing solution to our customers. This one-stop design, engineering and manufacturing solution allows us to align technology development with the diverse needs of our customers and to enable them to reduce the time required to develop new products and bring them to market. We currently serve a diversified customer base consisting of approximately 1,600 customers in various markets throughout the world, including aerospace and defense, computing, automotive components, medical, industrial and instrumentation related products, as well as networking/communications infrastructure products. Our customers include both original equipment manufacturers (OEMs) and electronic manufacturing services (EMS) providers.

In April 2020, we had two structural changes to our business: 1) the divestiture of our Mobility business unit and 2) the restructuring of our electro-mechanical solutions business (E-M Solutions).

The sale of the Mobility business unit was a strategic divestiture which allows us to focus on longer cycle markets and reduces our exposure to short product cycle and seasonal consumer markets which historically have been prone to greater demand volatility. The Mobility business was also more capital intensive resulting in higher capital spending and lower operating margins as compared to our continuing business. As a result, the remaining TTM business is expected to be less seasonal and less cyclical with more stable financial performance. In addition, the cash proceeds from the sale allowed us to repay \$400 million of our Term Loan B, thus reducing our financial leverage and strengthening our balance sheet.

We also restructured our E-M Solutions business unit which involved the closure of our Shenzhen and Shanghai E-M Solutions facilities in the fourth quarter of 2020. The strategic rationale for this action is based on TTM’s increasing focus on designing and manufacturing differentiated, higher margin products such as PCBs and RF components and sub-assemblies. Additionally, local government authorities had communicated to TTM that they intend to expropriate the land where the Shanghai E-M Solutions facility is located.

All of the metrics discussed in this Form 10-K exclude the Mobility business unit, but still include the two E-M Solutions facilities that have ceased operations.

In prior periods, we managed our worldwide operations based on two reportable segments: PCB and E-M Solutions. During the year ended December 28, 2020, our RF and Specialty Components (RF&S Components) operating segment met the quantitative threshold for separate presentation as a reportable segment. The RF&S Components reportable segment was previously aggregated with the PCB reportable segment. As a result, we report our worldwide operations based on three reportable segments: (1) *PCB*, which consists of fifteen domestic PCB and sub-system plants; five PCB fabrication plants in China; and one in Canada; (2) *RF&S Components*, which consists of one domestic RF component plant and one RF component plant in China; and (3) *E-M Solutions*, which consists of three custom electronic assembly plants in China. Each segment operates predominantly in the same industries with

facilities that produce customized products for our customers and use similar means of product distribution. Note that following the completion of the restructuring of our E-M Solutions business unit, we will no longer be reporting that operating segment in 2021.

Additional information on our reportable segments and product information is contained in Note 17 of the Notes to Consolidated Financial Statements.

Industry Overview

PCBs are manufactured in panels from sheets of laminated material. Each panel is typically subdivided into multiple PCBs, each consisting of a pattern of electrical circuitry etched from copper to provide an electrical connection between the components mounted to it. PCBs serve as the foundation for virtually all electronic products, including the electronic components integrated into automobiles, high-end commercial electronic equipment (such as medical equipment, data communications routers, switches and servers) and aerospace and defense electronic systems.

Products designed to offer faster data transmission, thinner and more lightweight packaging, and reduced power consumption generally require increasingly complex PCBs to meet these criteria. By using advanced technology PCB product solutions such as High Density Interconnect (HDI) and Substrate-like PCB (SLP) technologies, circuit densities can be increased, thereby providing for smaller products with higher packaging densities. Furthermore, rigid-flex circuits can be found in small and lightweight end products and other space-challenged electronics packaging applications across all end markets. Some PCB manufacturers also manufacture high performance substrates that serve as the interconnect between integrated circuits (ICs) and the PCB's in many advanced electronic products serving a wide variety of end markets. We collectively refer to all of these technologies as "advanced technologies," and they generally have growth rates which are higher than conventional technologies. In addition, most of our markets have low volume requirements during the prototype stage that demand a highly flexible manufacturing environment which later transitions to a higher volume requirement during product ramp.

According to estimates in a November 2020 report by Prismark Partners, worldwide demand for PCBs is expected to be \$64.0 billion in 2020. Of this worldwide demand for production in 2020, Prismark Partners reports that PCB production in the Americas accounted for approximately 4% (approximately \$2.9 billion), PCB production in China accounted for approximately 54% (approximately \$34.3 billion), and PCB production in the rest of the world accounted for approximately 42% (approximately \$26.8 billion). According to the same report by Prismark Partners, worldwide demand for PCBs is forecast to grow at a 5.1% compound annual growth rate (CAGR) from 2019 to 2024 driven largely by substrate and HDI technologies. Prismark Partners expects mid-single digit growth in 2021, in line with its long term forecast, despite a stronger than expected 2020. The PCB market in 2020 was surprisingly resistant to demand and supply challenges related to the coronavirus (COVID-19) as strength in the defense, cloud/data center, and medical markets offset weakness in the automotive, industrial, and commercial aerospace markets.

Industry Trends

We believe that several trends impacting the PCB manufacturing industry will benefit us in the future. These trends include:

Shorter electronic product life cycles, which create opportunities for PCB manufacturers that can offer engineering support in the prototype stage and manufacturing scalability throughout the production life cycle.

Increasing complexity of electronic products, which requires technologically complex PCBs that can accommodate higher speeds and component densities, including HDI, flexible, and substrate-like PCBs as well as intricately engineered RF components and subsystems.

Higher demand for reliable product manufactured in the U.S., encompassing better oversight on sub-tier supply chain materials and controls. In addition, the trade war between the U.S. and China has increased the importance of supply chain partners with strong domestic capabilities and manufacturing footprint.

Increasing use of PCB technology in diverse end markets as advanced electronics enable new capabilities. Many end markets that TTM serves are seeing a renaissance of growth opportunities due to the implementation of sophisticated electronics. In the defense market, solid-state radar system referred to as active electronic scanned array (AESA) being adopted in key new defense programs, replacing legacy mechanical systems. In the medical end market, remote diagnostic systems and robotics are seeing increasing adoption. In networking/communications, investments in 5G infrastructure and advanced networking are seeing demand for more advanced PCBs, supporting an ever connected world. Finally, in the automotive market an increasing trend toward sophisticated safety systems, automated driving, electric/hybrid vehicles and miniaturization of electronic devices in the automotive industry is driving increasing electronic content and higher PCB usage in automobiles, particularly with regard to the increased demand for advanced technologies like HDI, and RF PCBs for radar.

Supply chain consolidation by commercial OEMs. We believe that PCB manufacturers which can offer one-stop manufacturing capabilities — from prototype to volume production — and integration capabilities have a competitive advantage in the market.

Our Strategy

Our goal is to be a leading global provider of time-critical, one-stop manufacturing services for highly complex PCBs, RF components and RF subsystems. Our core strategy includes the following elements:

Provide differentiated capabilities beyond the base PCB by incorporating advanced design-to-specification engineering support, testing, components and specialized assembly into the value-added package provided to customers. With the acquisition of Anaren in 2018, TTM has moved beyond build-to-print manufacturing and assembly capabilities to engage with customers in designing a more complete RF solution to meet their technology needs. With the additional design capabilities, TTM now provides cost effective, ready for manufacture, enabling technologies to the customer. We continue to build on the Anaren acquisition to deepen our RF engagement with key aerospace and defense customers as well as to carry this same capability to our commercial automotive, telecommunications and networking customers.

Maintain our customer-driven culture and provide superior service to our customers in our core markets of aerospace and defense, automotive, computing and storage, medical/industrial/instrumentation, and networking/communications. Our customer-oriented culture is designed to achieve extraordinary service, competitive differentiation, and superior execution. Our customer-oriented strategies include engaging in co-development of new products, capturing new technology products for next generation equipment, and continuing investments to enhance our broad offering of PCB and RF/microwave technologies. We believe our ability to anticipate and meet customers' needs is critical to retaining existing customers and attracting leading companies as new customers.

Drive operational efficiency and productivity. We are highly focused on improving our operational execution to increase efficiency, productivity and yields. We strongly believe in the benefits of sharing best practices across our extensive manufacturing footprint and rely on stringent goals for throughput, quality and customer satisfaction to measure our effectiveness. The fast paced nature of our business requires a disciplined approach to manufacturing that is rooted in continuous improvement.

Accelerate customer, end-market, and technology diversification through strategic mergers and acquisitions. We have a history of executing successful acquisitions that have been key to our growth and profitability. We continuously look for strategic opportunities that could facilitate our efforts to further diversify into other growing end markets as well as expand our presence in our existing end markets such as aerospace and defense. We will also look for strategic opportunities that further strengthen our leading edge technology capabilities. For example, the acquisition of Anaren in 2018 added critical RF engineering, simulation and integration capabilities and the acquisition of i3's assets in 2019 allowed us to broaden our technology portfolio for high mix, low volume advanced technology PCBs.

Accelerate our expansion into the growing markets using our advanced technology as a key point of differentiation. With rising requirements for faster data transmission, shrinking features (i.e., lightweight and thin), and lower power consumption, many PCB designs have migrated to more complex HDI PCBs from conventional multi-layer PCB technologies. This trend began with PCBs used in portable devices such as smartphones and other mobile devices but has become an increasing trend in other end markets, such as automotive, networking/communications, medical, and aerospace and defense. As our customers consolidate their supply chains, our objective is to differentiate ourselves as a strategic supplier with the technology breadth to meet most, if not all, of our customers' PCB and RF related requirements.

Address customer needs in all stages of the product life cycle. By providing a one-stop solution, we work to service our customers' needs from the earliest stages of product design and development through volume production. We believe that by servicing our customers early in the development process, we are able to demonstrate our capabilities and establish an incumbent position early in the product development cycle, which translates into additional opportunities as our customers move into volume production. We believe our expertise is enhanced by our ability to deliver highly complex PCBs to customers in significantly compressed lead times. This rapid delivery service enables OEMs to develop sophisticated electronic products more quickly and reduce their time to market. We believe we will be able to increase customer engagement with customized RF solutions from the concept stage through volume production, which typically results in intensified customer engagement.

Deliver consistently strong financial performance and execute on our balance sheet strategy. We aspire to deliver industry-leading financial performance. We expect to achieve this by servicing our customers' needs in higher-growth end markets in a cost-efficient and effective manner. We believe that this strategy will allow us to generate strong cash flows, which will provide us with the financial flexibility to continue to invest in our business, including through opportunistic acquisitions, and increase value for our shareholders through opportunistic capital structure actions.

Continuously enhance the elements that make TTM an appealing employer. We aim to attract the right employees to TTM who align with our values and desire growth in their professional careers. Our employee engagement model, emphasis on communications and inclusion, commitment to career development and talent, and collaborative culture are the top reasons employees embrace TTM. Our ability to retain valued talent while attracting candidates is paramount to our continued human capital strategy.

Products and Services

We offer a wide range of PCB products, RF components, and backplane/custom assembly solutions, including conventional PCBs, RF and microwave circuits, HDI PCBs, flexible PCBs, rigid-flex PCBs, custom assemblies and system integration, IC substrates, passive RF components, advanced ceramic RF components, hi-reliability multi-chip modules, and beamforming and switching networks. We also offer certain value-added services to support our customers' needs. These include design-for-manufacturability (DFM), PCB layout design, simulation and testing services, and quick turnaround (QTA) production. For our RF sub-assemblies and components, we provide specialized assembly and RF testing to provide a value-added solution to our customers. By offering this wide range of PCB products, RF components and sub-systems and complementary value-added services, we are able to provide our customers with a "one-stop" manufacturing solution for their PCB and integration requirements. This differentiates us from our competition and enhances our customer relationships.

Conventional PCBs

A conventional PCB is made from a composite laminate that is metalized with a conductive material such as copper. The PCB is the basic platform used to interconnect components in most electronic products including computers, communications equipment, high-end consumer electronics, automotive controls, commercial aerospace and defense systems and medical and industrial equipment. Conventional PCBs can be classified as single-sided, double-sided and multi-layer boards.

We focus on higher layer count conventional PCBs. A multi-layer PCB can accommodate more complex circuitry than a single-sided or double-sided PCB and as such requires more sophisticated production techniques. The number of layers comprising a PCB often increases with the complexity of the end product. For example, a simple consumer device such as a garage door controller may use a single-sided or double-sided PCB, while a high-end network router or computer server may use a PCB with 30 or more layers.

RF and microwave circuits

We produce and test specialized circuits used in radio-frequency or microwave emission and collection applications. These products are typically used for radar, transmit/receive antennas and similar wireless applications. Markets for these products include defense, avionics, satellite, and commercial applications including telecommunications, networking and automotive. The manufacture of these products requires advanced materials, equipment, and methods that are highly specialized and distinct from conventional printed circuit manufacturing techniques. We also offer specialized radio-frequency assembly and test services. We have developed integrated solutions across our facilities and capabilities to provide sophisticated integrated electronics for numerous platforms, ranging from digital RF memory (DRFM) to frequency up/down converters (UDC) and channelized amplifiers for military and space applications.

High density interconnect or HDI PCBs

Our facilities in North America and China also produce high density interconnect (HDI) PCBs, which are PCBs with higher interconnect density per unit area requiring more sophisticated technology and manufacturing processes for their production than conventional PCB products. HDI PCBs are boards with high-density characteristics including micro-sized holes, or microvias (diameter at or less than 0.15 mm), and fine line circuitry (circuit line width and spacing at or less than 0.075 mm) and are fabricated with thin high-performance materials, thereby enabling more interconnection functions per unit area. HDI PCBs generally are manufactured using a sequential build-up process in which circuitry is formed in the PCB one layer at a time through successive drilling, plating and lamination cycles. In general, a board's complexity is a function of interconnect and circuit density, layer count, laminate material type and surface finishes. As electronic devices have become smaller and more portable with higher functionality, demand for advanced HDI PCB products has increased dramatically. We define advanced HDI PCBs as those having more than one layer of microvia interconnection structure.

Substrate-like PCBs or SLPs

Substrate-like PCBs (SLPs) represent the next evolution of high end HDI PCBs. SLPs are PCBs with even higher interconnect density per unit area than the traditional Advanced HDI PCBs described above requiring an even more sophisticated manufacturing technology adapted from IC substrate fabrication with enhancements to the subtractive and additive techniques of traditional PCBs. This enables fine line circuitry (circuit line width and spacing at or less than 0.03 mm). Demand for this type of high-density circuit is beginning to penetrate the markets of more traditional PCBs. In addition, we now offer an alternative approach to building SLP technology in the United States for lower volume, higher mix commercial and aerospace and defense applications.

Flexible PCBs

Flexible PCBs are printed circuits produced on flexible films, allowing them to be folded or bent to fit the available space or allowing for application movement. We manufacture circuits on flexible substrates that can be installed in three-dimensional applications for electronic packaging systems. Use of flexible circuitry can enable improved reliability and electrical performance, reduced weight and reduced assembly costs when compared with traditional wire harness or ribbon cable packaging. Flexible PCBs

can provide for flexible electronic connectivity of an electrical device's apparatus such as printer heads, cameras, TVs, mobile handsets, and tablets. For some of our flexible PCB customers, we also assemble components onto the flexible PCBs we manufacture.

Rigid-flex PCBs

Rigid-flex circuitry provides a simple means to integrate multiple PCB assemblies and other elements such as display, input or storage devices without wires, cables or connectors, replacing them with thin, light composites that integrate wiring in ultra-thin, flexible ribbons between rigid sections. In rigid-flex packaging, a flexible circuit substrate provides a backbone of wiring with rigid multilayer circuit sections built up as modules where needed.

Since the ribbons can be bent or folded, rigid-flex provides a means to compactly package electronics in three dimensions with dynamic or static bending functions as required, enabling miniaturization and thinness of product design. The simplicity of rigid-flex integration also generally reduces the number of parts and interconnections required, which can improve reliability.

Rigid-flex technology is essential to a broad range of applications including aerospace and defense, industrial and transportation systems requiring high reliability; hand-held and wearable electronics such as, video cameras and music players where thinness and mechanical articulation are essential; and ultra-miniaturized products such as headsets, medical implants and semiconductor packaging where size and reliability are paramount.

Custom assemblies

Our assembly facilities produce custom electronic assemblies. Custom electronic assemblies refers to a variety of PCB assemblies such as backplane and mid-plane assemblies, flexible and rigid-flex assemblies and RF assemblies. Each of these assemblies involves mounting electronic components to a printed circuit board and then testing the assembly for electrical continuity.

IC substrates

IC substrates provide the mechanical support and electrical interconnect used to package ICs (integrated circuits or semiconductors) either in single chip packages or multi-chip modules. IC substrates, also known as chip carriers, are highly miniaturized circuits manufactured by a process largely similar to that for PCBs but requiring the use of ultra-thin materials and including micron-scale features, because they must bridge the gap between sub-micron IC features and millimeter scale PCBs. Consequently, IC substrates are generally manufactured in a clean room environment to ensure products are free of defects and contamination and employ advanced HDI processes and manufacturing approaches used in SLP technology.

Passive RF Components

Our line of products consists of off-the-shelf surface mount microwave components which provide passive microwave signal distribution functions. These products were developed to provide a low-cost high performance signal distribution component, which could be placed on standard printed circuit boards with automated production equipment. The primary applications of these products are currently in equipment for cellular base stations and in WLAN, Bluetooth, and satellite television. In cellular base stations, our surface mount products are utilized in RF power amplifiers, and are also found in low-noise amplifiers, radios, and antennas. 5G advancements and the continued proliferation of wireless technology may create new applications for these products across other end markets.

Advanced Ceramic RF Components

Our ceramic offerings include standard and etched thick-film ceramic substrates. Etched thick-film ceramic circuits compete favorably with thin-film ceramic circuits in cost while providing comparable performance. These products are generally customer designed in close collaboration with our engineering staff to ensure the highest possible performance and manufacturability. These capabilities are aimed at high performance applications in the medical, industrial, and defense markets.

Hi-Reliability Multi-Chip Modules

We offer custom hybrid and multi-chip modules, high-performance radiation-hardened and space-qualified micro-electronics and power management and control electronics.

Beamforming and Switching Networks

Our beamforming technologies are used in military and aerospace applications, offering a variety of active and passive high-performance RF assemblies, including L-band/LEO and L- and S-band/GEO space beamformers, UHF thru Ka-band radar AESA RF networks, Butler matrices, multi-octave, and more.

Quick turnaround services

We refer to our rapid delivery services as "quick turnaround" or "QTA", because we provide custom-fabricated PCBs to our customers within as little as 24 hours to ten days. As a result of our ability to rapidly and reliably respond to the critical time requirements of our customers, we generally receive premium pricing for our QTA services as compared to standard lead time prices.

- *Prototype production.* In the design, testing, and launch phase of a new electronic product's life cycle, our customers typically require limited quantities of PCBs in a very short period of time. We satisfy this need by manufacturing prototype PCBs in small quantities, with delivery times ranging from as little as 24 hours to ten days.
- *Ramp-to-volume production.* After a product has successfully completed the prototype phase, our customers introduce the product to the market and require larger quantities of PCBs in a short period of time. This transition stage between low-volume prototype production and volume production is known as ramp-to-volume. Our ramp-to-volume services typically include manufacturing up to a few hundred PCBs per order with delivery times ranging from five to 15 days.

Thermal management

Increased component density on circuit boards often requires improved thermal dissipation to reduce operating temperatures. We produce printed circuits with heavy copper cores and both embedded and press-fit coins. In addition, we produce PCBs with electrically passive heat sinks laminated externally on a circuit board or between two circuit boards, as well as PCBs with electrically active thermal cores.

Manufacturing Technologies

The market for our products is characterized by rapidly evolving technology. In recent years, the trend in the electronic products industry has been to increase the speed, complexity, and performance of components while reducing their size. We believe our technological capabilities allow us to address the needs of manufacturers to bring complicated electronic products to market faster.

To manufacture PCBs, we generally receive circuit designs directly from our customers in the form of computer data files, which we review to ensure data accuracy and product manufacturability. Processing these data files with computer aided manufacturing (CAM) technology, we generate images of the circuit patterns that we then physically develop on individual layers, using advanced photographic and direct imaging processes. Through a variety of plating and etching processes, we selectively add and remove conductive materials to form horizontal layers of thin circuitry, which are separated by electrical insulating material. A multilayer circuit board is produced by laminating together multiple layers of circuitry, using intense heat and pressure under vacuum. Vertical connections between layers are achieved by drilling and plating through small holes, called vias. Vias are made by highly specialized drilling equipment capable of achieving extremely fine tolerances with high accuracy. We specialize in high layer count PCBs with extremely fine geometries and tolerances. Because of the tolerances involved, we employ clean rooms in certain manufacturing processes where tiny particles might otherwise create defects on the circuit patterns. We also use automated optical inspection systems and electrical testing systems to ensure consistent quality of the circuits we produce.

We believe that our highly specialized equipment and advanced manufacturing processes enable us to reliably produce PCBs with the following characteristics:

- *High layer count.* Manufacturing PCBs with a large number of layers is difficult to accomplish due to the accumulation of manufacturing tolerances and registration systems required. In our PCB reportable segment, we regularly manufacture PCBs with more than 30 layers on a quick-turn and volume basis.
- *Blind and buried vias.* Vias are drilled holes that provide electrical connectivity between layers of circuitry in a PCB. Blind vias connect the surface layer of the PCB to an internal layer and terminate at the internal layer. Buried vias are holes that do not reach either surface of the PCB but allow inner layers to be interconnected. Products with blind and buried vias can be made thinner, smaller, lighter and with higher component density and more functionality than products with traditional vias.
- *Microvias.* HDI technology utilizes microvias, which are small vias with diameters generally less than 0.15 mm after plating. Advanced HDI products may also require the microvias to be fully filled using a specialized plating process so that additional microvia structures can be stacked to form more complex interconnections. These microvias consume much less space on the layers they connect, thereby providing for greater wiring densities and flexibility, and also providing closer spacing of components and their attachment pads. The fabrication of PCBs with microvias requires specialized equipment, such as laser drills, and highly developed process knowledge. Applications such as handheld wireless devices employ microvias to obtain a higher degree of functionality from a given surface area.
- *Embedded passives.* Embedded passive technology involves embedding either capacitive or resistive elements inside the PCB, which allows for removal of passive components from the surface of the PCB and thereby leaves more surface area for active components. Use of this technology provides greater surface area for surface-mounted ICs and better signal performance, as well as increased functionality of products with higher component density.
- *Fine line traces and spaces.* Traces are the connecting copper lines between the different components of the PCB, and spaces are the distances between traces. The smaller the traces and the tighter the spaces, the higher the density of the PCB and the greater the expertise required to achieve a desired final yield performance level. We are able to manufacture PCBs with traces and spaces less than 0.030 mm.

- *High aspect ratios.* The aspect ratio is the ratio between the thickness of the PCB and the diameter of a drilled hole. As the aspect ratio increases, it becomes increasingly more difficult to consistently and reliably form, electroplate and finish all the holes on a PCB. In production, we are able to provide aspect ratios of up to 30:1.
- *Thin core processing.* A core is the basic inner-layer building block material from which PCBs are constructed. A core consists of a flat sheet of material comprised of glass-reinforced resin with copper foil laminated on either side. The thickness of inner-layer cores is typically determined by the overall thickness of the PCB and the number of layers required. The demand for thinner cores derives from the requirements for thinner PCBs, higher layer counts and various electrical parameters. Core thickness in our PCBs ranges from as little as 0.025 mm up to 1.57 mm.
- *Advanced hole fill processes.* Our advanced hole fill processes provide designers the opportunity to increase the density of component placements by reducing the surface area required to place many types of components. In traditional design, components are routed from their surface interfaces through via connections in order to access power and ground connections and the internal circuitry used to connect to other discrete components. Our advanced hole fill processes provide methods to allow for vias to be placed inside their respective surface mount pads by filling the vias with a thermoset epoxy and plating flat copper surface mount pads directly over the filled hole.
- *Advanced materials.* We manufacture circuit boards using a wide variety of advanced dielectric materials. These high-performance materials offer electrical, thermal, and long-term reliability advantages over conventional materials but are more difficult to manufacture. We are certified by Underwriters Laboratories to manufacture PCBs using many types and combinations of these specialty materials. This broad offering allows us to manufacture PCBs for a wide array of end-use applications, including highly complex PCBs for niche and high-end commercial and aerospace and defense markets.
- *Quick Turn Manufacturing.* In addition, in circumstances where our customers require time critical engineering and manufacturing services, we are able to meet our customers' need with our quick-turn manufacturing capabilities.

Our RF Engineering organization principally designs and manufactures state-of-the-art microwave-based hardware for use in advanced radar systems, advanced jamming systems, missiles and decoys, electronic surveillance systems and satellite and ground based communication systems. Several core manufacturing technology areas include:

- *Microwave Assembly Technology.* Our Microwave product capabilities include simple isolator components for large scale phased array radars to very complex highly integrated Electronic Warfare Line Replaceable Units. All products are designed internally to customer specifications using the latest versions of microwave design and simulation software, coupled with an extensive internal design library. Our radar beamforming solutions are realized through internal design, manufacturing and highly automated test processes for circulators, RF distribution and manifold assemblies. Automated pick-and-place, surface mount reflow, fully automated visual inspection and automated test stands ensure highly repeatable integrated microwave assembly performance. Our environmental lab test capability is used for product qualification and Highly Accelerated Life Testing when required.
- *Analog Hybrid Module Technology.* Analog Hybrid Modules are assembled in our Microelectronics Center of Excellence, which is certified to MIL-PRF-38534 and -38535 Class H and Class K. We continue to invest in state-of-the-art equipment for precision microelectronic assembly processes including custom ceramic substrate manufacturing, eutectic die attach, automated epoxy dispense, wire bonding, lid attach and lead forming. All parts are electrically tested for performance and subjected to environmental testing as required.
- *Ceramic Technology.* Low Temperature Co-fired Ceramic (LTCC) circuits are well-suited for high performance RF packages for multi-function applications such as transmit-receive modules or other RF integrated modules. We developed proprietary processes to allow for the use of less expensive conductors (Silver vs. traditional Gold) in the LTCC product thus providing significantly lower cost options to our customers. We developed a proprietary etched thick film process resulting in thin film performance at a much reduced cost. We recently deployed customized equipment to support automated test, visual and electrical inspection, and final tape-and-reel for ceramic resistor products significantly reducing cost and enhancing product quality.

Customers and Markets

Our customers include both OEMs and EMS companies that primarily serve the aerospace and defense, automotive, computing, medical/industrial/instrumentation, and networking/communications end markets of the electronics industry. Included in the end markets that our OEM and EMS customers serve is the U.S. government. As a result, we are a supplier, primarily as a subcontractor, to the U.S. government. Our five largest OEM customers in 2020 excluding the Mobility business unit were, in alphabetical order, Huawei Technology Co. Ltd., Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Technologies and Robert Bosch GmbH.

See table in Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* for the percentage of our net sales in each of the principal end markets we served.

Sales attributed to OEMs include sales made through EMS providers. Although our contractual relationships are with the EMS companies, we typically negotiate price and volume requirements directly with the OEMs. In addition, we are on the approved vendor lists of several of our EMS providers. This positions us to participate in business that is awarded at the discretion of the EMS provider.

Our sales and marketing strategy focuses on building long-term relationships with our customers' engineering and new product introduction personnel early in the product development phase, frequently through strategic account management teams. Traditional build-to-print opportunities involve TTM engineering providing design for manufacture reviews and making recommendations for both manufacturability and cost reductions without impacting specifications. Prototype builds to verify design ensue, along with the early stages of production. As the product then matures from the prototype stage to volume production, we shift our focus to the customers' procurement departments in order to capture sales at each point in the product's life cycle. Our design to specification capabilities allow us to engage at the onset in the engineering cycle at critical aerospace and defense, automotive, telecommunications, and networking customers as they begin the process of specifying an RF requirement. At that stage, we are able to support our customers by designing a complete or specific portions of an RF solution as well as providing early prototyping and test support for that solution. TTM will then meet the ramp to volume and volume production requirements of our customers.

Our staff of engineers, sales support personnel, and managers assist our sales representatives in advising customers with respect to manufacturing feasibility, design review, and technological capabilities through direct communication and visits. We combine our sales efforts with customer service personnel at each facility to better serve our customers. Each large customer is typically assigned an account manager to coordinate all of the Company's services across all of our facilities. Additionally, the largest and most strategic customers are also supported by select program management and engineering teams. Our global sales force is comprised of direct sales personnel, complemented by commission-based independent representatives, and supports customers throughout North America, Europe, Asia and the Middle East.

Our North America footprint includes facilities from our PCB and RF&S Components reportable segments with sixteen PCB fabrication plants located in California, Colorado, Connecticut, New Hampshire, New York, Ohio, Oregon, Utah, Virginia, Wisconsin, and Ontario, Canada; and one RF component plant located in New York.

Our China footprint includes facilities from our PCB, RF&S Components and E-M Solutions reportable segments. We have five PCB fabrication plants located in Hong Kong, Huiyang, Dongguan, Guangzhou and Zhongshan, China; one RF component plant located in Suzhou, China; and three custom assembly and system integration operations in Shanghai and Shenzhen, China for most of 2020 until we closed our Shenzhen and Shanghai E-M Solutions facilities in the fourth quarter of 2020. Currently within our E-M Solutions reportable segment, we only have one custom assembly operation in Shanghai, China.

For certain risks attendant to our foreign operations, see Item 1A, *Risk Factors*.

For information regarding credit to customers, see Note 11 of the Notes to Consolidated Financial Statements.

Suppliers

The primary raw materials we use in PCB manufacturing include copper-clad laminate, chemical solutions such as copper and gold for plating operations, photographic film, carbide drill bits, and plastic for testing fixtures. Although we have preferred suppliers for some raw materials used in the manufacture of PCBs, most of our raw materials are generally readily available in the open market from numerous other potential suppliers.

The primary raw materials we use in RF components, RF subsystems, backplane assemblies and other PCB assemblies are manufactured components such as PCBs, ceramic and ferrite substrates, connectors, capacitors, resistors, diodes and integrated circuits, many of which are custom made and controlled by our customers' approved vendors. The more complicated RF subsystems may require us to purchase integrated sub-assemblies and super-components such as RF oscillators, frequency converters, power supplies and microprocessors. These components for backplane assemblies and other PCB assemblies in some cases have limited or sole sources of supply. For example, in some instances, our customers will require us to use a specific component from a particular supplier or require us to use a component provided by the customer itself, in which case we may have a single or limited number of suppliers for these specific components. The backplane assemblies, PCB assemblies and precision metal fabricated chassis and enclosures produced by us may be incorporated into a fully integrated and tested system delivered to our customer. These products often incorporate procured power, thermal, interconnect and mechanical components sourced from the customer directed or our selected suppliers.

We typically use just-in-time procurement practices to maintain our raw materials inventory at low levels and work closely with our suppliers to obtain technologically advanced raw materials. In addition, we periodically seek alternative supply sources to ensure that we are receiving competitive pricing and service. While we have experienced shortages in the market place for certain specific raw materials, we believe we can acquire adequate raw materials in the future.

Competition

Despite industry consolidation, the PCB industry remains fragmented and characterized by intense competition. There are several competitive factors our customers consider when choosing their supplier including, but not limited to, technical capabilities, pricing, service, support, reliability, quality production and location. Our principal PCB and substrate competitors include AT&S (Austria Technologie & Systemtechnik Aktiengesellschaft), Chin-Poon Industrial Co., Ltd., ISU Petasys Co., Ltd., Sanmina Corporation, Shennan Circuits Co., Ltd., Suzhou Dongshan Precision Manufacturing Co., Ltd., Tripod Technology Corporation, Unimicron Technology Corporation, WUS Printed Circuit Co., Ltd., and Zhen Ding Technology Holding Ltd. Our competition for RF products include Cobham plc, Crane Aerospace & Electronics, Mercury Systems, Inc., RN2 Technologies Co., and Smiths Group plc.

We believe that our key competitive strengths include:

Leading global PCB manufacturer. We are one of the largest and most diversified PCB manufacturers in the world and enjoy significant economies of scale, with net sales of approximately \$2.1 billion for fiscal 2020. The PCB industry is highly fragmented with the top 40 PCB providers comprising approximately 72% of market share based on 2019 revenue, according to Prismark Partners. As our customers consolidate their supply base, we offer the technology breadth and scale to emerge as a preferred partner.

Breadth of technology and products. We offer a wide range of PCB and RF products, including HDI PCBs, conventional PCBs, flexible PCBs, rigid-flex PCBs, custom assemblies, passive RF components, advanced ceramic RF components, hi-reliability multi-chip modules, beamforming and switching networks and integrated circuit (IC) substrates. We also offer certain value-added services to support our customers' needs. These include RF design to specification capability, design for manufacturability (DFM), PCB layout design, simulation and testing services, and QTA services. By providing these value-added services to customers, we are able to provide our customers with a "one-stop" manufacturing solution, which we believe enhances our relationships with our customers.

Diversified business model. Our sales are diversified by a well-balanced portfolio of end markets which we serve and by the customers we sell to within those end markets. We believe this diversity reduces our exposure to, and reliance on, any single end market or customer. We enjoy a large and diverse customer base with over 1,600 customers, as well as long-term relationships in excess of ten years with our ten largest customers. Furthermore, for fiscal 2020, our five largest customers are not concentrated in any single end market, but rather are represented across three of our end markets.

Focused on attractive end markets with a favorable growth outlook and dependence on sophisticated product capabilities. We believe that our global manufacturing footprint and breadth of capabilities enables us to serve multiple key end markets for the PCB industry. The aerospace & defense industry in particular provides an opportunity for us as we combine our traditional market strength in core PCB technology with the advanced technologies and RF capabilities we offer for growing requirements in AESA radar systems for defense applications.

One-stop solution for customers. We are capable of providing a one-stop design, manufacturing and test solution to our customers with design services, engineering support and prototype development through final volume production around the globe. This one-stop solution allows us to better serve our customers, many of whom are based in time-critical high growth markets, enabling our customers to reduce the time required to develop new products and bring them to market. We utilize a facility specialization strategy in which each customer is directed to the facility best suited to the customer's product type, delivery time, complexity and volume needs, which enables us to reduce the time from order placement to delivery. As our commercial customers ramp to volume, we are positioned to seamlessly transition them to one of our volume facilities in China.

Leading aerospace and defense supplier. We have passed OEM and government certification processes, and administrative requirements associated with participation in government and commercial aerospace programs. When supplying various departments and agencies of the U.S. government, we are required to maintain facility security clearances under the National Industrial Security Program Operating Manual (NISPOM) and International Traffic in Arms Regulations (ITAR). Along with supply of traditional and RF PCBs, we offer a variety of RF components and sub-assemblies, as well as our engineering services and assembly capabilities which allow us to bring additional value to our customers.

Seasonality

Orders for our products generally correspond to the production schedules of our customers. We historically experience seasonal fluctuations in the first quarter due to the Chinese New Year holidays, which typically results in lower net sales for that quarter. We attribute this decline to shutdowns of our customers' and our own China based manufacturing facilities surrounding the Chinese New Year public holidays, which normally occur in January or February of each year.

Intellectual Property

We now have a total of more than 165 patents, with approximately 20 pending patent applications. Most of these patents stem from our 2018 acquisition of Anaren and 2019 asset and technology acquisition from i3 Electronics, Inc. (i3). Our PCB business depends on the effectiveness of our fabrication techniques, proprietary PCB structures, and our ability to continually improve our manufacturing processes. We rely on the collective experience of our employees in the manufacturing process to ensure that we

continuously evaluate and adopt new technologies available within our industry. In addition, we depend on robust training, recruiting, and retention of our employees, who are required to be knowledgeable in the operation of advanced equipment and complicated manufacturing processes. In regards to our RF products, the vast majority are proprietary and protected or covered by approximately thirty-two patents and ten currently pending patent applications directed towards products for both the wireless infrastructure and aerospace and defense markets.

National Security Matters

A portion of our business consists of manufacturing defense and defense-related items for various departments and agencies of the U.S. government, including the U.S. Department of Defense (DoD), which requires that we maintain facility security clearances under the NISPOM. The NISPOM requires that a corporation with significant foreign ownership maintaining a facility security clearance take steps to prevent foreign control or influence, referred to as "FOCI." Pursuant to these laws and regulations, effective October 2010, we entered into a Special Security Agreement (SSA) with the DoD; Su Sih (BVI) Limited, or Su Sih (a foreign owner of our capital stock), and Mr. Tang Hsiang Chien (as the beneficial owner of Su Sih). At that time, Su Sih owned approximately 35% of the total outstanding shares of our common stock and Mr. Tang was a board member of the Company. Mr. Tang is no longer a member of our board and, based on the most recent filings by Mr. Tang and Su Sih with the SEC, Su Sih owns less than 6% of the Company, thereby reducing the concern of Su Sih or Mr. Tang influencing the Company to compromise classified information or adversely affect the performance of classified contracts.

Other Governmental Regulations

Our operations, particularly those in North America, are subject to a broad range of regulatory requirements relating to export control, environmental compliance, waste management, and health and safety matters. In particular, we are subject to the following:

- U.S. Department of State regulations, including the Arms Export Control Act (AECA) and ITAR located at 22 CFR Parts 120-130;
- U.S. Department of Commerce regulations, including the Export Administration Regulations (EAR) located at 15 CFR Parts 730-744;
- Office of Foreign Asset Control (OFAC) regulations located at 31 CFR Parts 500-599;
- U.S. Occupational Safety and Health Administration (OSHA), and state OSHA and Department of Labor laws pertaining to health and safety in the workplace;
- U.S. Environmental Protection Agency regulations pertaining to air emissions; waste water discharges; and the use, storage, discharge, and disposal of hazardous chemicals used in the manufacturing processes; the reporting of chemical releases to the environment; and the reporting of chemicals manufactured in by-products that are beneficially recycled;
- Department of Homeland Security regulations regarding the storage of certain chemicals of interest;
- corresponding state laws and regulations, including site investigation and remediation;
- corresponding U.S., county and city agencies;
- corresponding regulations and agencies in China for our Chinese facilities;
- material content directives and laws that ban or restrict certain hazardous substances in products sold in member states of the European Union, China, and other countries and jurisdictions;
- SEC rules that require reporting of the use of certain metals (conflict minerals) originating in the Democratic Republic of the Congo and the 9 countries surrounding it pursuant to Section 1502 of the Dodd-Frank Act; and
- reporting requirements of the California Transparency in Supply Chains Act of 2010 that requires reporting on efforts to eradicate slavery and human trafficking in retailers' and manufacturers' supply chains.

The process to manufacture PCBs requires adherence to city, county, state, federal, and foreign environmental laws and regulations regarding the storage, use, handling, and disposal of chemicals, solid wastes and other hazardous materials, as well as compliance with wastewater and air quality standards. We believe that our facilities in the United States and Canada comply in all material respects with applicable environmental laws and regulations. In China, the government has a history of changing legal requirements with no or minimal notice. We believe that our facilities in China comply in all material respects with current applicable environmental laws and regulations and has resources in place to maintain compliance to them. The capital expenditure costs expected for environmental improvement initiatives are included in our annual capital expenditure projections.

Human Capital

How we manage and leverage our human capital is essential in executing our strategy. At TTM, a key differentiator is our culture, which has been shaped through considerable thought and energy. Our culture has served us well as we integrate acquired companies and optimize our organizational structures and teams to better serve our customers. The following elements underpin our culture:

- Vision – Inspiring innovation as the preeminent technology solutions company, generating industry leading growth and profitability, driven by empowered employees, with an unwavering value system
- Mission – Deliver superior value, growth and profit by providing customers with market leading, differentiated solutions and an extraordinary customer experience
- The “TTM Values” that apply to all employees are: Integrity, Teamwork, Clear Communication and Performance Excellence.
- Our people leaders are guided by our “Leadership Principles” which are: Communications, Collaboration, and Career Development.
- “One TTM” – embodies our collective “team” approach to solving problems, working together, robust collaboration, and proactive communication throughout the organization to better serve our customers

Commitment to Values and Ethics. The foundation of TTM’s strategic vision is its corporate culture and its way of doing business with integrity, teamwork, clear communication, and performance excellence. We demonstrate the importance we place on these values through our goal setting and performance management process as well as providing ethics training to employees every year.

Along with the TTM Values and our Leadership Principles, we discuss and act in accordance with, and provide annual training for, our Code of Conduct (“Code of Conduct”), which outlines our expectations and provides guidance for all employees. Our Code of Conduct includes topics such as anti-corruption, discrimination, harassment, privacy, appropriate use of company assets, protecting confidential information, and reporting Code of Conduct violations. Our Code of Conduct reinforces the importance of fostering an open, welcoming environment in which all employees have a voice and a confidential outlet to raise concerns regarding potential violations.

Our commitment to our communities is demonstrated through our volunteer efforts, charitable donations, and sponsorships. As an employer, our local sites choose the organizations to affiliate with that best reflect our values. Some examples are: Second Harvest Food Bank, Toys for Tots, United Way, Ronald McDonald House, and Habitat for Humanity.

Talent Development & Acquisition. Talent development is a collective and continuous effort of all of our people managers. We engage in regular talent reviews to calibrate on performance and potential development gaps and progress, and evaluate the depth and strength of our integrated succession plans. Our approach to learning is a continuous one, regardless of experience level or tenure. We extend leadership development programs with individually tailored development plans anchored in dedicated coaching and separate internal mentors. Additionally, we extend competency-based training, sponsor job rotations, and form project teams comprised of emerging talents. We provide tuition reimbursement and assistance, as well as a monthly stipend to engineers to pay down student debt. In 2020, we expanded our online learning platforms, offerings, and tools, as we continued our effort to build a global learning management system. While we primarily develop internal talent for expanded roles, we have curated an annual summer technical internship program most recently focused on robotics and automation. Coupled with co-op programs in some locations, this technical talent pipeline feeds our succession planning efforts.

Diversity, Equity and Inclusion (DEI). Recognizing and respecting our global presence, we strive to maintain a diverse and inclusive workforce that reflects the communities that we serve. As part of our efforts, TTM’s DEI Council works collaboratively across the organization to drive our DEI strategy and support key initiatives focused on continuing to cultivate university partnerships to further shape our early career talent pipeline. Our US workforce is approximately 50% ethnically diverse and comprised of nearly 40% females. We are committed to having a diverse talent pipeline and have trained our talent acquisition team and human resources personnel in diversity sourcing strategies. TTM has memberships with external partner organizations to attract diverse talent. Our targeted outreach to our internship program has yielded over 50% diversity hires. Our sites actively participate in campus hiring and job fairs throughout the year, supporting various events within each region and driving recruitment campaigns that leverage our social media platforms; this is in addition to specific campaigns dedicated to diversity and veteran hiring. We have also expanded and continue to develop our existing policies and training against harassment, bullying and the elimination of bias in the workplace.

Employee Engagement & Turnover. We periodically survey our employees and benefit from favorable participation rates to identify and act on specific opportunities to enhance our work environment, improve communications, and strengthen the connection between supervisors and employees. In the midst of the COVID-19 pandemic, we focused our most recent survey on employee care, our response to COVID-19 including safety protocols and communications, and the transition to remote work for approximately 10% of our workforce.

In 2020, we pivoted to a virtual platform to hold our town hall sessions, change agent network meetings, and quarterly business updates with management teams. Our change agent network was created to improve communications from the factory and office floor up to the senior management team. We select several employees within each site who are respected, influential and representative of the employee base to serve as change agents. This network discusses and then communicates the key initiatives within the sites in addition to raising employee concerns. Additionally, these teams prioritize site initiatives around community activities, site improvement projects, recognition programs, and new communication methods.

We review employee turnover rates paying particular attention to supervisor and technical retention. We believe the emphasis we place on selecting, training and coaching supervisors positively impacts their ability to lead people. Our leadership principles of communications, collaboration and career development are designed to improve the employee experience and strengthen working relationships. Through internal surveys, it is clear our employees value their relationships with their supervisors, career opportunities and the corporate culture.

Compensation and Benefits. We continually review our compensation and benefit programs to ensure we are in line with market conditions. In addition to competitive wages, all employees participate in one of our variable incentive programs which rewards for performance. These range from comprehensive benefit plans for eligible employees including mental health, employee assistance program (EAP), telemedicine offerings, several medical and dental plans with qualifying employer funded health savings accounts, life insurance, specialty programs for diabetes and weight loss, wellness challenges, and an on-site health & physical therapy center at our largest U.S. facility.

Employee Health & Safety. TTM moved quickly at the onset of the COVID-19 pandemic to ensure a safe environment for our employees by activating our global pandemic response plan. Early lessons learned from our Asia teams helped shape and guide our progressive safety protocols for the remainder of the Company. Our regional leadership teams, with guidance from executive management, developed and implemented safeguards consisting of policies, procedures, and lessons learned reports covering: COVID-19 symptom awareness, effective hygiene practices, travel restrictions, visitor vetting and screening, social distancing, face covering expectations, temperature and health screening, work-from-home requirements, enhanced workplace cleaning, and large-scale decontamination. Notable achievements from 2020 include:

- We procured two mask-making machines early in 2020 and produced and distributed over 5 million masks to: employees and their families, first responders, fire and police departments, retirement homes and our local communities in every region we operate.
- As an essential business, we quickly shifted to remote work for a portion of our employee population while maintaining continuous operations within the plants.
- We implemented IT solutions to maintain critical operations and projects to increase our flexibility to work from home.
- In the US, we established an employee paid time off (PTO) donation program and distributed over 6,000 PTO hours to employees with COVID-19 hardships in 2020.
- We expanded services of our on-site health center to include mental health and additional physical therapy offerings.

Employee Data

As of December 28, 2020, we had approximately 16,700 employees. Of our employees, approximately 15,500 were involved in manufacturing and engineering, 500 worked in sales and marketing, and approximately 700 worked in accounting, information systems and other support capacities. Of our 5,500 U.S. employees, none are represented by unions. In China, approximately 10,300 employees are members of the All-China Federation of Trade Unions and accordingly are considered to be represented by a labor union. We believe that our relations with both our union and non-union employees are generally satisfactory.

Availability of Reports Filed with the Securities and Exchange Commission

We are a Delaware corporation founded in 1998, with our principal executive offices located at 200 East Sandpointe, Suite 400, Santa Ana, CA 92707. Our telephone number is (714) 327-3000. Our website address is www.ttm.com. Information included on our website is not incorporated into this report. Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports are available without charge on our website at <https://investors.ttm.com/>, as soon as reasonably practicable after they are filed with or furnished electronically to the Securities and Exchange Commission (SEC). Our SEC filings are also available to the public at www.sec.gov. Copies are also available without charge by (i) telephonic request by calling our Investor Relations Department at (714) 327-3000, (ii) e-mail request to investor@ttmtech.com, or (iii) a written request to TTM Technologies, Inc., Attention: Investor Relations, 200 East Sandpointe, Suite 400, Santa Ana, CA 92707.

ITEM 1A. RISK FACTORS

An investment in our common stock involves a high degree of risk. You should carefully consider the factors described below, in addition to those discussed elsewhere in this report, in analyzing an investment in our common stock. If any of the events described below occurs, our business, financial condition, and results of operations would likely suffer, the trading price of our common stock could fall, and you could lose all or part of the money you paid for our common stock. The risk factors described below are not the only ones we face. Risks and uncertainties not known to us currently, or that may appear immaterial, also may have a material adverse effect on our business, financial condition, and results of operations.

In addition, the following risk factors and uncertainties could cause our actual results to differ materially from those projected in our forward-looking statements, whether made in this report or the other documents we file with the SEC, or our annual or quarterly reports to stockholders, future press releases, or orally, whether in presentations, responses to questions, or otherwise.

Risks Related to our Business

We serve customers and have manufacturing facilities throughout the world and are subject to global pandemic and other similar risks, including without limitation, COVID-19, which could materially adversely affect our business, financial condition, and results of operations.

Global pandemics or other disasters or public health concerns in regions of the world where we have operations or source material or sell products could result in the disruption of our business. Specifically, these pandemics, disasters and health concerns can result in increased travel restrictions and extended shutdowns of certain businesses in the region, as well as social, economic, or labor instability. Disruptions in our product shipments or impacts on our manufacturing in affected regions over a prolonged period could have a material adverse impact on our business and our financial results.

On March 11, 2020, the World Health Organization announced that COVID-19 infections had become a pandemic, and on March 13, 2020, the U.S. President announced a National Emergency relating to the disease. Widespread infection in the United States and abroad has the potential for catastrophic impact. National, state and local authorities have recommended social distancing and have imposed or are considering quarantine and isolation measures on large portions of the population, including mandatory business closures. These measures, while intended to protect human life, are expected to have serious adverse impacts on domestic and foreign economies of uncertain severity and duration. The effectiveness of economic stabilization efforts, including proposed government payments to affected citizens and industries, is uncertain.

In particular, our business may be negatively impacted by the fear of exposure to or actual effects of COVID-19 and other disease outbreaks, epidemics, pandemics and similar widespread public health concerns. These impacts include but are not limited to:

- failure of third parties on which we rely, including, without limitation, our suppliers, commercial banks, and other external business partners, to meet their obligations to us, caused by significant disruptions in their ability to do so or their own financial or operational difficulties;
- supply chain risks such as scrutiny or embargoing of goods produced in infected areas;
- reduced workforces, which may be caused by, but not limited to, the temporary inability of the workforce to work due to illness, quarantine, or government mandates;
- temporary business closures due to reduced workforces or government mandates;
- reduced demand for our products and services caused by, but not limited to, the effect of quarantine or other travel restrictions or financial hardship on the businesses in the industries we service;
- restrictions to our business as a result of federal or state laws, regulations, orders or other governmental or regulatory actions, if adopted; or
- lawsuits from employees and others exposed to COVID-19 at our facilities, which may involve large demands or substantial defense costs that our professional and general liability insurance may not cover.

Any of the foregoing factors, or other cascading effects that are not currently foreseeable, could materially increase our costs, negatively impact our sales or damage the Company's financial condition, results of operations, cash flows and its liquidity position, possibly to a significant degree. The duration of any such impacts cannot be predicted because of the sweeping and uncertain nature of the circumstances involving the COVID-19 pandemic.

Uncertainty and adverse changes in the economy and financial markets, including the worldwide electronics industry, could have an adverse impact on our business and operating results.

Uncertainty or adverse changes in the economy could lead to a significant decline in demand for the end products manufactured by our customers, which, in turn, could result in a decline in the demand for our products and pressure to reduce our prices. Any decrease in demand for our products could have an adverse impact on our financial condition, operating results and cash flows. Uncertainty and adverse changes in the economy could also increase the cost and decrease the availability of potential sources of

financing and increase our exposure to losses from bad debts, either of which could have a material adverse effect on our financial condition, operating results and cash flows.

A majority of our revenue is generated from the electronics industry, which is characterized by intense competition, relatively short product life cycles, and significant fluctuations in product demand. The industry is subject to economic cycles and recessionary periods. Due to the uncertainty in the end markets served by most of our customers, we have a low level of visibility with respect to future financial results. Consequently, our past operating results, earnings, and cash flows may not be indicative of our future operating results, earnings, and cash flows.

We serve customers and have manufacturing facilities outside the United States and are subject to the risks characteristic of international operations, including recently imposed tariffs.

We have significant manufacturing operations in Asia and Canada and sales offices located in Asia and Europe. We continue to consider additional opportunities to make foreign investments and construct new foreign facilities.

For the year ended December 28, 2020, we generated approximately 51% of our net sales from non-U.S. operations, and a significant portion of our manufacturing material was provided by international suppliers during this period. The United States' trade policies and those of foreign countries are subject to change which could adversely affect our ability to purchase and sell goods and materials without significant tariffs, taxes or duties that may be imposed on the materials we purchase or the goods we sell, thereby increasing the cost of such materials and potentially decreasing our margins. Further, our revenues could be impacted if our customers' ability to sell their goods is reduced by such tariffs, taxes or duties. Both the U.S. and Chinese governments have included PCBs among items subjected to tariffs imposed on imports from such countries, which may negatively impact our revenue and profitability. In addition, we are subject to risks relating to significant international operations, including but not limited to:

- managing international operations;
- imposition of governmental controls;
- unstable regulatory environments;
- compliance with employment laws;
- implementation of disclosure controls, internal controls, financial reporting systems, and governance standards to comply with U.S. accounting and securities laws and regulations;
- limitations on imports or exports of our product offerings;
- fluctuations in the value of local currencies;
- inflation or changes in political and economic conditions;
- public health crises, such as the COVID-19 pandemic;
- labor unrest, rising wages, difficulties in staffing, and geographical labor shortages;
- government or political unrest;
- longer payment cycles;
- language and communication barriers, as well as time zone differences;
- cultural differences;
- increases in duties and taxation levied on our products;
- other potentially adverse tax consequences;
- imposition of restrictions on currency conversion or the transfer of funds;
- travel restrictions;
- expropriation of private enterprises;
- the potential reversal of current favorable policies encouraging foreign investment and trade;
- the potential for strained trade relationships between the United States and its trading partners, including trade tariffs which could create competitive pricing risk; and
- government imposed sanction laws and regulations.

We are subject to risks of currency fluctuations.

A portion of our cash, other current assets and current liabilities is held in currencies other than the U.S. dollar. Changes in exchange rates among other currencies and the U.S. dollar will affect the value of these assets or liabilities as re-measured to U.S.

dollars on our balance sheet. To the extent that we ultimately decide to repatriate some portion of these funds to the United States, the actual value transferred could be impacted by movements in exchange rates. Any such type of movement could negatively impact the amount of cash available to fund operations or to repay debt. Additionally, we have revenues and costs denominated in currencies other than the U.S. dollar (primarily the Renminbi (RMB)). Fluctuations in the exchange rates between the U.S. dollar and the RMB could result in increases or decreases in our costs or revenues which could negatively impact our business, financial condition, and results of operations. Significant inflation or disproportionate changes in foreign exchange rates could occur as a result of general economic conditions, acts of war or terrorism, changes in governmental monetary or tax policy, or changes in local interest rates. Further, China's government imposes controls over the convertibility of RMB into foreign currencies, which subjects us to further currency exchange risk.

We have pursued and intend to continue to pursue potential divestitures of assets and acquisitions of other businesses and may encounter risks associated with these activities, which could harm our business and operating results. If we are unable to manage our growth effectively, our business, financial condition, and results of operations could be materially adversely affected.

As part of our business strategy, we expect that we will continue to align our strategy by pursuing potential divestitures of assets and acquisitions of businesses, technologies, assets, or product lines that complement or expand our business. Risks related to such activity may include:

- the potential inability to successfully integrate acquired operations and businesses or to realize anticipated synergies, economies of scale, or other expected value;
- diversion of management's attention from normal daily operations of our existing business to focus on integration of the newly acquired business;
- unforeseen expenses associated with the integration of the newly acquired business;
- difficulties in managing production and coordinating operations at new sites;
- the potential loss of key employees of acquired or divested operations;
- the potential inability to retain existing customers of acquired companies when we desire to do so;
- insufficient revenues to offset increased expenses associated with acquisitions;
- the potential decrease in overall gross margins associated with acquiring a business with a different product mix;
- the inability to identify certain unrecorded liabilities;
- the inability to consummate a potential divestiture due to regulatory constraints;
- the separation of business infrastructure involved in a potential divestiture may create disruption in our business;
- the tax burden related to the divestiture may be larger than expected;
- the potential divestiture of assets or product lines could create dis-synergies and change our profitability;
- the potential need to restructure, modify, or terminate customer relationships of the acquired or divested assets or company;
- an increased concentration of business from existing or new customers; and
- the potential inability to identify assets best suited to our business plan.

Acquisitions may cause us to:

- enter lines of business and/or markets in which we have limited or no prior experience;
- issue debt and be required to abide by stringent loan covenants;
- assume liabilities;
- record goodwill and intangible assets that will be subject to impairment testing and potential periodic impairment charges;
- become subject to litigation and environmental issues, which include product material content certifications related to conflict minerals;
- incur unanticipated costs;
- incur large and immediate write-offs; and
- incur substantial transaction-related costs, whether or not a proposed acquisition is consummated.

Acquisitions of high technology companies are inherently risky, and no assurance can be given that our recent or future acquisitions will be successful. Failure to manage and successfully integrate acquisitions we make could have a material adverse effect

on our business, financial condition, and results of operations. Even when an acquired company has already developed and marketed products, product enhancements may not be made in a timely fashion. In addition, unforeseen issues might arise with respect to such products after any such acquisition.

As we continue to experience growth in the scope and complexity of our operations, we may be required to continue to implement additional operating and financial controls and hire and train additional personnel. There can be no assurance that we will be able to do so in the future, and failure to do so could jeopardize our expansion plans and seriously harm our operations. In addition, growth in our capacity could result in reduced capacity utilization and a corresponding decrease in gross margins.

If we are unable to maintain satisfactory capacity utilization rates, our business, financial condition, and results of operations would be materially adversely affected.

Given the high fixed costs of our operations, decreases in capacity utilization rates can have a significant effect on our business. Accordingly, our ability to maintain or enhance gross margins will continue to depend, in part, on maintaining satisfactory capacity utilization rates. In turn, our ability to maintain satisfactory capacity utilization will depend on the demand for our products, the volume of orders we receive, and our ability to offer products that meet our customers' requirements at competitive prices. If current or future production capacity fails to match current or future customer demands, our facilities would be underutilized, our sales may not fully cover our fixed overhead expenses, and we would be less likely to achieve expected gross margins. If forecasts and assumptions used to support the realizability of our long-lived assets change in the future, significant impairment charges could result that would materially adversely affect our business, financial condition, and results of operations.

In addition, we generally schedule our quick turnaround production facilities at less than full capacity to retain our ability to respond to unexpected additional quick-turn orders. However, if these orders are not received, we may forego some production and could experience continued excess capacity. If we conclude we have significant, long-term excess capacity, we may decide to permanently close one or more of our facilities and lay off some of our employees. Closures or lay-offs could result in our recording restructuring charges such as severance, other exit costs, and asset impairments, as well as potentially causing disruptions in our ability to supply customers.

We have a significant amount of goodwill and other intangible assets on our consolidated balance sheet. If our goodwill or other intangible assets become impaired in the future, we would be required to record a non-cash charge to earnings, which may be material and would also reduce our stockholders' equity.

As of December 28, 2020, our consolidated balance sheet included \$918.6 million of goodwill and definite-lived intangible assets. During the year ended December 28, 2020, the Company recorded an impairment charge for goodwill of \$69.2 million related to its RF and Specialty Components (RF&S Components) reportable segment. We periodically evaluate whether events and circumstances have occurred, such that the potential for reduced expectations for future cash flows coupled with further decline in the market price of our stock and market capitalization may indicate that the remaining balance of goodwill and definite-lived intangible assets may not be recoverable. If factors indicate that assets are impaired, we would be required to reduce the carrying value of our goodwill and definite-lived intangible assets, which could harm our results during the periods in which such a reduction is recognized.

Our results of operations are often subject to demand fluctuations and seasonality. With a high level of fixed operating costs, even small revenue shortfalls would decrease our gross margins.

Our results of operations fluctuate for a variety of reasons, including:

- timing of orders from and shipments to major customers;
- the levels at which we utilize our manufacturing capacity;
- price competition;
- changes in our mix of revenues generated from quick-turn versus standard delivery time services;
- expenditures, charges or write-offs, including those related to acquisitions, facility restructurings, or asset impairments; and
- expenses relating to expanding existing manufacturing facilities.

A significant portion of our operating expenses is relatively fixed in nature, and planned expenditures are based in part on anticipated orders. Accordingly, unexpected revenue shortfalls may decrease our gross margins. In addition, we have experienced sales fluctuations due to seasonal patterns in the capital budgeting and purchasing cycles, as well as inventory management practices of our customers and the end markets we serve. These seasonal trends have caused fluctuations in our operating results in the past and may continue to do so in the future. Results of operations in any period should not be considered indicative of the results that may be expected for any future period. In addition, our future quarterly operating results may fluctuate and may not meet the expectations of securities analysts or investors.

We participate in the competitive, cyclical automotive industry, which is subject to strict quality control standards. Failure to meet quality standards may adversely affect our business, financial condition and results of operations.

A significant portion of our sales are to customers within the automotive industry. The automotive industry has historically experienced multi-year cycles of growth and decline. If sales of automobiles should decline or go into a cyclical down turn, our sales could decline and this could have a materially adverse impact on our business, financial condition and result of operations.

In addition, for safety reasons, automotive customers have strict quality standards that generally exceed the quality requirements of other customers. If such products do not meet these quality standards, our business, financial condition, and results of operations may be materially adversely affected. These automotive customers may require long periods of time to evaluate whether our manufacturing processes and facilities meet their quality standards. If we were to lose automotive customers due to quality control issues, we might not be able to regain those customers or gain new automotive customers for long periods of time, which could have a material adverse effect on our business, financial condition, and results of operations. Moreover, we may be required under our contracts with automotive industry customers to indemnify them for the cost of warranties and recalls relating to our products.

The prominence of EMS companies as our customers could reduce our gross margins, potential sales, and customers.

Sales to EMS companies represented approximately 37%, 36% and 40% of our net sales for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively. Sales to EMS providers include sales directed by OEMs as well as orders placed with us at the EMS providers' discretion. EMS providers source on a global basis to a greater extent than OEMs. The growth of EMS providers increases the purchasing power of such providers and has in the past, and could in the future, result in increased price competition or the loss of existing OEM customers. In addition, some EMS providers, including some of our customers, have the ability to directly manufacture PCBs and create backplane assemblies. If a significant number of our other EMS customers were to acquire these abilities, our customer base might shrink, and our sales might decline substantially. Moreover, if any of our OEM customers outsource the production of PCBs and creation of backplane assemblies to these EMS providers, our business, financial condition, and results of operations may be materially adversely affected.

We depend upon a relatively small number of OEM customers for a large portion of our sales, and a decline in sales to major customers would materially adversely affect our business, financial condition, and results of operations.

A small number of customers are responsible for a significant portion of our sales. Our five largest OEM customers accounted for approximately 29%, 27% and 25% of our net sales for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively, and one customer represented 11% of our net sales for the year ended December 28, 2020. Furthermore, our business has benefited from OEMs deciding to outsource their PCB manufacturing and backplane assembly needs to us, and our future revenue growth partially depends on new outsourcing opportunities from OEMs. Sales attributed to OEMs include both direct sales as well as sales that the OEMs place through EMS providers. Our customer concentration could fluctuate, depending on future customer requirements, which will depend in large part on market conditions in the electronics industry segments in which our customers participate. The loss of one or more significant customers or a decline in sales to our significant customers would materially adversely affect our business, financial condition, and results of operations. In addition, we generate significant accounts receivable in connection with providing manufacturing services to our customers. If one or more of our significant customers were to become insolvent or were otherwise unable to pay for the manufacturing services provided by us, our business, financial condition, and results of operations would be materially adversely affected.

In addition, during industry downturns, we may need to reduce prices to limit the level of order losses, and we may be unable to collect payments from our customers. There can be no assurance that key customers would not cancel orders, that they would continue to place orders with us in the future at the same levels as experienced by us in prior periods, that they would be able to meet their payment obligations, or that the end-products that use our products would be successful. This concentration of customer base may materially adversely affect our business, financial condition, and results of operations due to the loss or cancellation of business from any of these key customers, significant changes in scheduled deliveries to any of these customers, or decreases in the prices of the products sold to any of these customers.

We depend on the U.S. government for a significant portion of our business, which involves unique risks. Changes in government defense spending or regulations could have a material adverse effect on our business, financial condition, and results of operations.

A significant portion of our revenues is derived from products and services that are ultimately sold to the U.S. government by our OEM and EMS customers and is therefore affected by, among other things, the federal government budget process. We are a supplier, primarily as a subcontractor, to the U.S. government and its agencies, as well as foreign governments and agencies. The contracts between our direct customers and the government end user are subject to political and budgetary constraints and processes, changes in short-range and long-range strategic plans, the timing of contract awards, the congressional budget authorization and appropriation processes, the government's ability to terminate contracts for convenience or for default, as well as other risks, such as contractor suspension or debarment in the event of certain violations of legal and regulatory requirements.

For the year ended December 28, 2020, aerospace and defense sales accounted for approximately 36% of our total net sales. The substantial majority of aerospace and defense sales are related to both U.S. and foreign military and defense programs. While we do not sell any significant volume of products directly to the U.S. government, we are a supplier to OEMs that sell to the U.S. government and its agencies, as well as foreign governments and agencies. Consequently, our sales are affected by changes in the defense budgets of the U.S. and foreign governments and may be affected by federal budget sequestration measures.

The domestic and international threat of terrorist activity, emerging nuclear states, and conventional military threats have led to an increase in demand for defense products and services and homeland security solutions in the recent past. Although a two-year budget agreement has recently been approved by the U.S. government and the budget agreement includes sustained spending on defense programs, the termination or failure to fund one or more significant contracts by the U.S. government could have a material adverse effect on our business, financial condition, and results of operations.

Future changes to the U.S. Munitions List could reduce or eliminate restrictions that currently apply to some of the products we produce. If these regulations or others are changed in a manner that reduces restrictions on products being manufactured overseas, we would likely face an increase in the number of competitors and increased price competition from overseas manufacturers, who are restricted by the current export laws from manufacturing products for U.S. defense systems.

We are exposed to the credit risk of some of our customers and to credit exposures in weakened markets.

Most of our sales are on an “open credit” basis, with standard industry payment terms. We monitor individual customer payment capability in granting such open credit arrangements, seek to limit such open credit to amounts we believe the customers can pay, and maintain reserves we believe are adequate to cover exposure for doubtful accounts. During periods of economic downturn in the electronics industry and the global economy, our exposure to credit risks from our customers increases. Although we have programs in place to monitor and mitigate the associated risks, such programs may not be effective in reducing our credit risks.

Additionally, our OEM customers often direct a significant portion of their purchases through a relatively limited number of EMS companies. Sales to EMS companies represented approximately 37%, 36% and 40% of our net sales for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively. Our contractual relationship is often with the EMS companies, who are obligated to pay us for our products. Because we expect our OEM customers to continue to direct our sales to EMS companies, we expect to continue to be subject to this credit risk with a limited number of EMS customers. If one or more of our significant customers were to become insolvent or were otherwise unable to pay us, our business, financial condition, and results of operations would be materially adversely affected.

We rely on suppliers and equipment manufacturers for the timely delivery of raw materials, components, equipment and spare parts used in manufacturing our PCBs. If a raw material supplier or equipment manufacturer goes bankrupt, liquidates, consolidates out of existence or fails to satisfy our product quality standards, or if the prices or availability of raw materials change, it could harm our ability to purchase new manufacturing equipment, service the equipment we have, or timely produce our products, thereby affecting our customer relationships.

To manufacture PCBs, we use raw materials such as laminated layers of fiberglass, copper foil, chemical solutions, gold, copper and other commodity products, which we order from our suppliers. For RF components, we use various high-performance materials such as ceramics and printed circuit board materials. In the case of backplane assemblies, components include connectors, sheet metal, capacitors, resistors and diodes, many of which are custom made and controlled by our customers’ approved vendors.

Consolidations and restructuring in our supplier base and equipment fabricators related to our raw materials purchases or the manufacturing equipment we use to fabricate our products may result in adverse changes in pricing of materials due to reduction in competition among our raw material suppliers or an elimination or shortage of equipment and spare parts from our manufacturing equipment supply base. Suppliers and equipment manufacturers may be impacted by other events outside our control including macro-economic events, financial instability, environmental occurrences, or supplier interruptions due to fire, natural catastrophes, public health crises (including, but not limited to, the COVID-19 pandemic) or otherwise. Suppliers and equipment manufacturers may extend lead times, limit supplies, or increase prices due to capacity constraints or other factors, which could harm our ability to deliver our products on a timely basis and negatively impact our financial results. In addition, in extreme circumstances, the suppliers we purchase from could cease production due to a fire, natural disaster, consolidation or liquidation of their businesses. As such, this may impact our ability to deliver our products on a timely basis, harm our customer relationships and negatively impact our financial results.

If raw material and component prices increase or if there is inflationary pressure on the cost of the metals that we use to produce our product, especially if the prices of copper, gold, palladium and other precious metals we use to manufacture our products increase, it may reduce our gross margins. Should the supply of materials used in the above manufacturing processes become limited, our ability to obtain the quantities necessary to meet our customers’ demand may be impacted which could cause us to encounter reduced revenue levels or price increases which would impact our profit margins. If either of these situations occurs, our financial condition and results of operations could be negatively impacted.

Our business, financial condition, and results of operations could be materially adversely affected by climate change initiatives.

Our manufacturing processes require that we purchase significant quantities of energy from third parties, which results in the generation of greenhouse gases, either directly on-site or indirectly at electric utilities. Both domestic and international legislation to address climate change by reducing greenhouse gas emissions could create increases in energy costs and price volatility. Considerable international attention is now focused on development of an international policy framework to guide international action to address climate change. Proposed and existing legislative efforts to control or limit greenhouse gas emissions could affect our energy sources and supply choices, as well as increase the cost of energy and raw materials that are derived from sources that generate greenhouse gas emissions.

Competition in the PCB market is intense, and we could lose market share, or our profit margins may decrease, if we are unable to maintain our current competitive position in end markets using our quick-turn, high technology, and high-mix manufacturing services.

The PCB industry is intensely competitive, highly fragmented, and rapidly changing. We expect competition to continue, which could result in price reductions, reduced gross margins, and loss of market share. In addition, we increasingly compete on an international basis, and new and emerging technologies may result in new competitors entering our markets.

Some of our competitors and potential competitors have advantages over us, including:

- greater financial and manufacturing resources that can be devoted to the development, production, and sale of their products;
- more established and broader sales and marketing channels;
- more manufacturing facilities worldwide, some of which are closer in proximity to OEMs;
- manufacturing facilities that are located in countries with lower production costs;
- lower capacity utilization, which in peak market conditions can result in shorter lead times to customers;
- ability to add additional capacity faster or more efficiently;
- preferred vendor status with existing and potential customers;
- greater name recognition; and
- larger customer bases.

In addition, these competitors may respond more quickly to new or emerging technologies or adapt more quickly to changes in customer requirements than we do. We must continually develop improved manufacturing processes to meet our customers' needs for complex products, and our manufacturing process technology is generally not subject to significant proprietary protection. During recessionary periods in the electronics industry, our strategy of providing quick-turn services, an integrated manufacturing solution, and responsive customer service may take on reduced importance to our customers. As a result, we may need to compete more on the basis of price, which would cause our gross margins to decline.

We and some of our competitors have reduced average selling prices in the past. In addition, competitors may reduce their average selling prices faster than our ability to reduce costs, which can also accelerate the rate of decline of our selling prices. When prices decline, we may also be required to write down the value of our inventory.

If we are unable to adapt our design and production processes in response to rapid technological change and process development, we may not be able to compete effectively.

The markets for our products and manufacturing services are characterized by rapidly changing technology and continual implementation of new designs and production processes. The future success of our business will depend in large part upon our ability to maintain and enhance our technological capabilities, to design and manufacture products that meet changing customer needs, and to successfully anticipate or respond to technological changes on a cost-effective and timely basis. We expect that the investment necessary to maintain our technological position will increase as customers make demands for products and services requiring more advanced technology on a quicker turnaround basis. For example, in 2021 in our PCB segment, we expect to continue to make significant capital expenditures to expand our HDI, RF technology, and other advanced manufacturing capabilities while in our RF&S Components segment, we are designing products that we hope our customers adopt and incorporate into their products. We may not be able to obtain access to additional sources of funds in order to respond to technological changes as quickly as our competitors. In addition, our failure to adopt and implement technological improvements quickly may cause inefficiencies in our production process as our product yields or quality may decrease, resulting in increased costs, and may lead to customers not adopting our product designs.

We also could encounter competition from new or revised manufacturing, production and design technologies that render existing manufacturing, production and design technology less competitive or obsolete. We may not respond effectively to the technological requirements of the changing market. If we need new technologies and equipment or if we are not able to design new

products acceptable to customers to remain competitive, the development, acquisition, and implementation of those designs, technologies and equipment may require us to make significant capital investments.

Products we manufacture may contain design or manufacturing defects, which could result in reduced demand for our services and liability claims against us.

We manufacture products to our customers' specifications, which are highly complex and may contain design or manufacturing errors or failures, despite our quality control and quality assurance efforts. Defects in the products we manufacture, whether caused by a design, manufacturing, or materials failure or error, may result in delayed shipments, customer dissatisfaction, a reduction or cancellation of purchase orders, or liability claims against us. If these defects occur either in large quantities or too frequently, our business reputation may be impaired. Since our products are used in products that are integral to our customers' businesses, errors, defects, or other performance problems could result in financial or other damages to our customers beyond the cost of the PCB, for which we may be liable. Although our invoices and sales arrangements generally contain provisions designed to limit our exposure to product liability and related claims, existing or future laws or unfavorable judicial decisions could negate these limitation of liability provisions. In addition, we manufacture products for a range of automotive customers. If any of our products are or are alleged to be defective, we may be required to participate in a recall of such products. As suppliers become more integral to the vehicle design process and assume more of the vehicle assembly functions, vehicle manufacturers are increasingly looking to their suppliers for contributions when faced with product liability claims or recalls. In addition, vehicle manufacturers, which have traditionally borne the costs associated with warranty programs offered on their vehicles, are increasingly requiring suppliers to guarantee or warrant their products and may seek to hold us responsible for some or all of the costs related to the repair and replacement of parts supplied by us to the vehicle manufacturer.

We may be unable to hire and retain sufficient qualified personnel, and the loss of any of our key executive officers could materially adversely affect our business, financial condition, and results of operations.

We believe that our future success will depend in large part on our ability to attract and retain highly skilled, knowledgeable, sophisticated, and qualified managerial and professional personnel. Furthermore, we have limited patent or trade secret protection for our manufacturing processes and rely on the collective experience of our employees involved in our manufacturing processes to ensure that we continuously evaluate and adopt new technologies in our industry. We may not be able to retain our executive officers and key personnel or attract additional qualified management in the future. We can make no assurances that future changes in executive management will not have a material adverse effect on our business, financial condition, or results of operations. Our business also depends on our continuing ability to recruit, train, and retain highly qualified employees, particularly engineering and sales and marketing personnel. The competition for these employees is intense, and the loss of these employees could harm our business. Further, our ability to successfully integrate acquired companies depends in part on our ability to retain key management and existing employees at the time of the acquisition.

Rising labor costs, including due to employee strikes and other labor-related disruptions may materially adversely affect our business, financial condition, and results of operations.

Our business is labor intensive, utilizing large numbers of engineering and manufacturing personnel. There is uncertainty with respect to rising labor costs. Furthermore, labor disputes and strikes based partly on wages have in the past slowed or stopped production by certain manufacturers in China. In some cases, employers have responded by significantly increasing the wages of workers at such plants. Any increase in labor costs due to minimum wage laws or customer requirements about scheduling and overtime that we are unable to recover in our pricing to our customers could materially adversely affect our business, financial condition, and results of operations. In addition, the high turnover rate and our difficulty in recruiting and retaining qualified employees and the other labor trends we are noting in China could result in a potential for defects in our products, production disruptions or delays, or the inability to ramp production to meet increased customer orders, resulting in order cancellation or imposition of customer penalties if we are unable to deliver products in a timely manner.

To respond to competitive pressures and customer requirements, we may further expand internationally in lower-cost locations. If we pursue such expansions, we may be required to make additional capital expenditures. In addition, the cost structure in certain countries that are now considered to be favorable may increase as economies develop or as such countries join multinational economic communities or organizations, causing local wages to rise. As a result, we may need to continue to seek new locations with lower costs and the employee and infrastructure base to support PCB manufacturing. We cannot assure investors that we will realize the anticipated strategic benefits of our international operations or that our international operations will contribute positively to our operating results.

In North America, we are experiencing wage inflation pressures, some of which are mandated by local and state governments. Further, we are experiencing rising health care costs. While we strive to manage these challenges, there can be no assurance that our efforts will succeed which would result in higher costs and lower profits.

Strikes or labor disputes with our unionized employees, primarily in China, may adversely affect our ability to conduct our business. If we are unable to reach agreement with any of our unionized work groups on future negotiations regarding the terms of their collective bargaining agreements, we may be subject to work interruptions or stoppages. Any of these events could be disruptive

to our operations and could result in negative publicity, loss of contracts, and a decrease in revenues. We may also become subject to additional collective bargaining agreements in the future if more employees or segments of our workforce become unionized, including any of our employees in the United States.

Infringement of our intellectual property rights could negatively affect us, and we may be exposed to intellectual property infringement claims from third parties that could be costly to defend, could divert management's attention and resources, and if successful, could result in liability.

We rely on a combination of copyright, patent, trademark, and trade secret laws, confidentiality procedures, contractual provisions, and other measures to establish and protect our proprietary and confidential information. All of these measures afford only limited protection. These measures may be invalidated, circumvented, breached, or challenged, and others may develop intellectual property, technologies or processes that are similar, or superior to, our intellectual property or technology. We may not have adequate controls and procedures in place to protect our proprietary and confidential information. Despite our efforts to protect our intellectual property and proprietary rights, unauthorized parties may attempt to copy, and succeed in copying, our products or may obtain or use information that we regard as proprietary or confidential. If it becomes necessary for us to resort to litigation to protect our intellectual property rights, any proceedings could be burdensome, costly, and distracting to management, and we may not prevail. Further, adequate remedies may not be available in the event of an unauthorized use or disclosure of our proprietary or confidential information. Failure to successfully establish or enforce our intellectual property rights could materially and adversely affect our business, financial condition, and results of operations. Furthermore, there is a risk that we may infringe on the intellectual property rights of others. As is the case with many other companies in the PCB industry, we from time to time receive communications from third parties asserting patent rights over our products and enter into discussions with such third parties. Irrespective of the validity or the successful assertion of such claims, we could incur costs in either defending or settling any intellectual property disputes alleging infringement. If any claims, whether or not they have merit, are brought against our customers for such infringement, we could be required to expend significant resources in defending such claims, developing non-infringing alternatives or obtaining licenses. We may not be successful in developing such alternatives or in obtaining such licenses on reasonable terms, or at all, and may be required to modify or cease marketing our products or services, which could disrupt the production processes, damage our reputation, and materially and adversely affect our business, financial condition, and results of operations.

Foreign laws may not afford us sufficient protections for our intellectual property, and we may not be able to obtain patent protection outside of the United States.

Certain nations that we operate in may not grant us certain intellectual property rights that are customarily granted in more developed legal systems. Patent law reform in the United States and other countries may also weaken our ability to enforce our patent rights or make such enforcement financially unattractive. For example, despite continuing international pressure on the Chinese government, intellectual property rights protection continues to present significant challenges to foreign investors and, increasingly, Chinese companies. Chinese commercial law is relatively undeveloped compared to the commercial law in our other major markets and only limited protection of intellectual property is available in China as a practical matter. Although we have taken precautions in the operations of our Chinese subsidiaries and in our joint venture agreements to protect our intellectual property, any local design or manufacture of products that we undertake in China could subject us to an increased risk that unauthorized parties will be able to copy or otherwise obtain or use our intellectual property, which could harm our business. We may also have limited legal recourse in the event we encounter patent or trademark infringement. Uncertainties with respect to the Chinese legal system may adversely affect the operations of our Chinese subsidiaries. China has put in place a comprehensive system of intellectual property laws; however, incidents of infringement are common, and enforcement of rights can, in practice, be difficult. If we are unable to manage our intellectual property rights, our business and operating results may be seriously harmed.

Damage to our manufacturing facilities due to fire, natural disaster, or other events could materially adversely affect our business, financial condition, and results of operations.

The destruction or closure of any of our facilities for a significant period of time as a result of fire, explosion, blizzard, act of war or terrorism, flood, tornado, earthquake, lightning, other natural disasters, required maintenance, or other events could harm us financially, increasing our costs of doing business and limiting our ability to deliver our manufacturing services on a timely basis.

Our insurance coverage with respect to damages to our facilities or our customers' products caused by natural disasters is limited and is subject to deductibles and coverage limits. Such coverage may not be adequate or continue to be available at commercially reasonable rates and terms.

In the event one or more of our facilities is closed on a temporary or permanent basis as a result of a natural disaster, required maintenance or other event, our operations could be significantly disrupted. Such events could delay or prevent product manufacturing and shipment for the time required to transfer production or repair, rebuild or replace the affected manufacturing facilities. This time frame could be lengthy and result in significant expenses for repair and related costs. While we have disaster recovery plans in place, there can be no assurance that such plans will be sufficient to allow our operations to continue in the event of every natural or man-made disaster, required repair or other extraordinary event. Any extended inability to continue our operations at unaffected facilities following such an event would reduce our revenue and potentially damage our reputation as a reliable supplier.

Risks Related to Our Indebtedness

We have substantial outstanding indebtedness, and our outstanding indebtedness could adversely impact our liquidity and flexibility in obtaining additional financing, our ability to fulfill our debt obligations and our financial condition and results of operations.

We have substantial debt and, as a result, we have significant debt service obligations. We maintain \$405.9 million outstanding in a Term Loan Facility due 2024 (Term Loan Facility) at a floating rate of LIBOR plus 2.5%, \$375.0 million of Senior Notes due 2025 (Senior Notes) at an interest rate of 5.63%, \$40.0 million outstanding under a \$150.0 million U.S. Asset-Based Lending Credit Agreement (U.S. ABL), and \$30.0 million outstanding under a \$150.0 million Asia Asset-Based Lending Credit Agreement (Asia ABL). We and a number of our direct and indirect subsidiaries also have various credit facilities and letters of credit. Such agreements also contain certain financial covenants which require us to maintain, under the occurrence of certain events, a consolidated fixed charge coverage ratio.

Subject to the limits contained in the credit agreements governing the Term Loan Facility, the U.S. ABL, the Asia ABL, the indenture governing the Senior Notes, and our other debt instruments, we may be able to incur substantial additional debt from time to time to finance working capital, capital expenditures, investments or acquisitions, or for other purposes. If we do so, the risks related to our high level of debt could intensify. Specifically, our high level of debt could have important consequences to us and our shareholders. For example, it could:

- make it more difficult for us to satisfy our obligations with respect to our indebtedness, which could in turn result in an event of default on such indebtedness;
- require us to use a substantial portion of our cash flow from operations for debt service payments, thereby reducing the availability of cash for working capital, capital expenditures, acquisitions and other general corporate purposes;
- impair our ability to obtain additional financing in the future for working capital, capital expenditures, acquisitions and other investments or general corporate purposes, which may limit our ability to execute our business strategy;
- diminish our ability to withstand a downturn in our business, the industry in which we operate or the economy generally and restrict us from exploiting business opportunities or making acquisitions;
- limit our flexibility in planning for, or reacting to, changes in our business and the industry in which we operate or the general economy;
- increase our vulnerability to general adverse economic and industry conditions, including movements in interest rates, which could result in increased borrowing costs;
- limit management's discretion in operating our business; and
- place us at a competitive disadvantage as compared to our competitors that have less debt as it could limit our ability to capitalize on future business opportunities and to react to competitive pressures or adverse changes.

In addition, the indenture governing the Senior Notes and the credit agreements governing the Term Loan Facility, the U.S. ABL and the Asia ABL contain restrictive covenants that will limit our ability to engage in activities that may be in our long-term best interest. Our failure to comply with those covenants could result in an event of default which, if not cured or waived, could result in the acceleration of all our debt.

Furthermore, we and our subsidiaries may decide to incur significant additional indebtedness in the future. Although the indenture governing the Senior Notes and the credit agreements governing the Term Loan Facility, the U.S. ABL and the Asia ABL will contain restrictions on the incurrence of additional indebtedness, these restrictions are subject to a number of qualifications and exceptions, and the additional indebtedness incurred in compliance with these restrictions could be substantial. These restrictions also will not prevent us from incurring obligations that do not constitute indebtedness.

Servicing our debt requires a significant amount of cash and we may not be able to generate sufficient cash to service all of our debt and may be forced to take other actions to satisfy our obligations under our debt, which may not be successful.

Based on certain parameters defined in the Term Loan Facility, including a First Lien Leverage Ratio, we may be required to make an additional principal payment on an annual basis if our First Lien Leverage Ratio is greater than 2.0.

Our ability to make scheduled payments on or to refinance our debt obligations and to fund planned capital expenditures and expansion efforts depends on our ability to generate cash in the future and our financial condition and operating performance, which are subject to prevailing economic and competitive conditions and to certain regulatory, competitive, financial, business and other factors beyond our control. We cannot assure you that we will maintain a level of cash flows from operating activities sufficient to permit us to pay the principal, premium, if any, and interest on our debt.

If our cash flows and capital resources are insufficient to fund our debt service obligations, we could face substantial liquidity problems and could be forced to reduce or delay investments and capital expenditures or to dispose of material assets or operations,

seek additional capital (which could include obtaining additional equity capital on terms that may be onerous or highly dilutive) or restructure or refinance our indebtedness. We may not be able to effect any such alternative measures, if necessary, on commercially reasonable terms or at all and, even if successful, those alternative actions may not allow us to meet our scheduled debt service obligations. The credit agreements governing the Term Loan Facility, the U.S. ABL and the Asia ABL and the indenture governing the Senior Notes will restrict our ability to dispose of assets and use the proceeds from those dispositions and may also restrict our ability to raise debt or equity capital to be used to repay other indebtedness when it becomes due. We may not be able to consummate those dispositions or to obtain proceeds in an amount sufficient to meet any debt service obligations then due.

In addition, we conduct certain of our operations through our subsidiaries. Accordingly, repayment of our indebtedness may be dependent on the generation of cash flow by our subsidiaries and their ability to make such cash available to us, by dividend, debt repayment or otherwise. Unless they are guarantors of the Senior Notes or our other indebtedness, our subsidiaries do not have any obligation to pay amounts due on our indebtedness or to make funds available for that purpose. Our subsidiaries may not be able to, or may not be permitted to, make distributions to enable us to make payments in respect of our indebtedness. Each subsidiary is a distinct legal entity, and under certain circumstances, legal and contractual restrictions may limit our ability to obtain cash from our subsidiaries. While the indenture governing the Senior Notes and the credit agreements governing the Term Loan Facility, the U.S. ABL and the Asia ABL will limit the ability of our subsidiaries to incur consensual restrictions on their ability to pay dividends or make other intercompany payments to us, these limitations are subject to qualifications and exceptions. In the event that we do not receive distributions from our subsidiaries, we may be unable to make required principal and interest payments on our indebtedness.

Our inability to generate sufficient cash flows to satisfy our debt obligations, or to refinance our indebtedness on commercially reasonable terms or at all, would materially and adversely affect our financial position and results of operations and our ability to satisfy our obligations under our indebtedness.

If we cannot make scheduled payments on our debt, we will be in default and holders of the Senior Notes could declare all outstanding principal and interest to be due and payable, the lenders under the Term Loan Facility, the U.S. ABL and the Asia ABL could terminate their commitments to loan money, the lenders could foreclose against the assets securing their borrowings and we could be forced into bankruptcy or liquidation.

Regulatory Risks

We are subject to the requirements of the National Industrial Security Program Operating Manual (NISPOM) for our facility security clearance, which is a prerequisite to our ability to perform on classified contracts for the U.S. government.

A facility security clearance is required in order to be awarded and perform on classified contracts for the Department of Defense and certain other agencies of the U.S. government. As a cleared entity, we must comply with the requirements of the NISPOM, and any other applicable U.S. government industrial security regulations. Further, due to the fact that a portion of our voting equity is owned by a non-U.S. entity, we are required to be governed by and operate in accordance with the terms and requirements of a Special Security Agreement (SSA). The terms of the SSA have been previously disclosed in our SEC filings.

If we were to violate the terms and requirements of the SSA, the NISPOM, or any other applicable U.S. government industrial security regulations (which may apply to us under the terms of classified contracts), we could lose our security clearance. We cannot be certain that we will be able to maintain our security clearance. If for some reason our security clearance is invalidated or terminated, we may not be able to continue to perform on classified contracts and would not be able to enter into new classified contracts, which could materially adversely affect our business, financial condition, and results of operations.

Our operations in China and Hong Kong subject us to risks and uncertainties relating to the laws and regulations of China and Hong Kong.

Under its current leadership, the government of China has been pursuing economic reform policies, including the encouragement of foreign trade and investment. No assurance can be given, however, that the government of China will continue to pursue such policies, that such policies will be successful if pursued, or that such policies will not be significantly altered from time to time, particularly in light of the increasingly tense trade climate with the United States. Despite progress in developing its legal system, China does not have a comprehensive and highly developed system of laws, particularly with respect to foreign investment activities and foreign trade. Enforcement of existing and future laws and contracts is uncertain, and implementation and interpretation thereof may be inconsistent. As the Chinese legal system develops, the promulgation of new laws, changes to existing laws, and the preemption of local regulations by national laws may adversely affect foreign investors. Further, any litigation in China may be protracted and may result in substantial costs and diversion of resources and management's attention. Also, the evolving landscape of the interrelation between China and Hong Kong may have an adverse impact on our operations in Hong Kong and may impact our ability to attract and maintain necessary talent in that area. In addition, though changes in government policies and rules are timely published or communicated, there is usually no indication of the duration of any grace period before which full implementation and compliance will be required. As a result, it is possible that we might operate our business in violation of new rules and policies before full compliance can be achieved. These uncertainties could limit the legal protections available to us and adversely impact our results of operations.

We are subject to risks for the use of certain metals from “conflict minerals” originating in the Democratic Republic of the Congo.

During the third quarter of 2012, the SEC adopted rules implementing the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank). These rules impose diligence and disclosure requirements regarding the use of “conflict minerals” mined from the Democratic Republic of Congo and neighboring countries. While these new rules continue to be the subject of ongoing litigation and, as a result, uncertainty, we submitted a conflict minerals report on Form SD with the SEC for the past seven years, most recently on May 29, 2020. Compliance with these rules results in additional costs and expenses, including costs and expenses incurred for due diligence to determine and verify the sources of any conflict minerals used in our products, in addition to the costs and expenses of remediation and other changes to products, processes, or sources of supply as a consequence of such verification efforts. These rules may also affect the sourcing and availability of minerals used in the manufacture of our PCBs, as there may be only a limited number of suppliers offering “conflict free” minerals that can be used in our products. There can be no assurance that we will be able to obtain such minerals in sufficient quantities or at competitive prices. Also, since our supply chain is complex, we may, at a minimum, face reputational challenges with our customers, stockholders, and other stakeholders if we are unable to sufficiently verify the origins of the minerals used in our products. We may also encounter customers who require that all of the components of our products be certified as conflict free. If we are not able to meet customer requirements, such customers may choose to disqualify us as a supplier, which could impact our sales and the value of portions of our inventory.

Our failure to comply with the requirements of environmental laws could result in litigation, fines, revocation of permits necessary to our manufacturing processes, or debarment from our participation in federal government contracts.

Our operations are regulated under a number of domestic and foreign environmental and safety laws and regulations that govern, among other things, the discharge of hazardous materials into the air and water, as well as the handling, storage, recycling, and disposal of such materials. These laws and regulations include the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Superfund Amendment and Reauthorization Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Toxic Substances Control Act, and the Federal Motor Carrier Safety Improvement Act, as well as analogous state, local, and foreign laws. Compliance with these environmental laws is a major consideration for us because our manufacturing processes use and generate materials classified as hazardous. Because we use hazardous materials and generate hazardous wastes in our manufacturing processes, we may be subject to potential financial liability for costs associated with the investigation and remediation of our own sites, or sites at which we have arranged for the disposal of hazardous wastes, if such sites become contaminated. Even if we fully comply with applicable environmental laws and are not directly at fault for the contamination, we may still be liable. The wastes we generate include spent ammoniacal and cupric etching solutions, metal stripping solutions, waste acid solutions, waste alkaline cleaners, waste oil, and waste waters that contain heavy metals such as copper, tin, lead, nickel, gold, silver, cyanide, and fluoride, and both filter cake and spent ion exchange resins from equipment used for on-site waste treatment.

Environmental law violations, including the failure to maintain required environmental permits, could subject us to fines, penalties, and other sanctions, including the revocation of our effluent discharge permits. This could require us to cease or limit production at one or more of our facilities and could have a material adverse effect on our business, financial condition, and results of operations. Even if we ultimately prevail, environmental lawsuits against us would be time consuming and costly to defend.

Environmental laws have generally become more stringent and we expect this trend to continue over time, especially in developing countries, imposing greater compliance costs and increasing risks and penalties associated with violation. We operate in environmentally sensitive locations, and we are subject to potentially conflicting and changing regulatory agendas of political, business, and environmental groups. Changes or restrictions on discharge limits, emissions levels, material storage, handling, or disposal might require a high level of unplanned capital investment or relocation to another global location where prohibitive regulations do not exist. It is possible that environmental compliance costs and penalties from new or existing regulations may materially adversely affect our business, financial condition, and results of operations.

We are increasingly required to certify compliance with various material content restrictions in our products based on laws of various jurisdictions or territories such as the Restriction of Hazardous Substances (RoHS) and Registration, Evaluation, Authorization and Restriction of Chemicals, or REACH directives in the European Union and China’s RoHS legislation. Similar laws have been adopted in other jurisdictions and may become increasingly prevalent. In addition, we must also certify as to the non-applicability of the EU’s Waste Electrical and Electronic Equipment directive for certain products that we manufacture. The REACH directive requires the identification of Substances of Very High Concern, or SVHCs periodically. We must survey our supply chain and certify to the non-presence or presence of SVHCs to our customers. As with other types of product certifications that we routinely provide, we may incur liability and pay damages if our products do not conform to our certifications.

We are also subject to an increasing variety of environmental laws and regulations in China, which impose limitations on the discharge of pollutants into the air and water and establish standards for the treatment, storage, and disposal of solid and hazardous wastes for us and our vendors that assist us in managing the waste generated by our manufacturing processes. The manufacturing of our products generates gaseous chemical wastes, liquid wastes, waste water, and other industrial wastes from various stages of the manufacturing process. Production sites, waste collectors, and vendors in China are subject to increasing regulation and periodic monitoring by the relevant environmental protection authorities. Environmental claims or the failure to comply with current or future

regulations could result in the assessment of damages or imposition of fines against us, suspension of production, or cessation of operations.

The process to manufacture PCBs requires adherence to city, county, state, federal, and foreign environmental laws and regulations regarding the storage, use, handling, and disposal of chemicals, solid wastes, and other hazardous materials, as well as compliance with wastewater and air quality standards. We rely on our vendors for the transportation and disposal of our solid and hazardous wastes generated by our manufacturing processes. If we are not able to find such services, our ability to conduct our business and our results of operations may be adversely impacted. In China, the government has a history of changing legal requirements with no or minimal notice. We believe that our facilities in China comply in all material respects with current applicable environmental laws and regulations and have resources in place to maintain compliance to them. The capital expenditure costs expected for environmental improvement initiatives are included in our annual capital expenditure projections.

Our international sales are subject to laws and regulations relating to corrupt practices, trade, and export controls and economic sanctions. Any non-compliance could have a material adverse effect on our business, financial condition, and results of operations.

We operate on a global basis and are subject to anti-corruption, anti-bribery, and anti-kickback laws and regulations, including restrictions imposed by the Foreign Corrupt Practices Act (FCPA). The FCPA and similar anti-corruption, anti-bribery, and anti-kickback laws in other jurisdictions generally prohibit companies and their intermediaries and agents from making improper payments to government officials or any other persons for the purpose of obtaining or retaining business. We operate and sell our products in many parts of the world that have experienced governmental corruption to some degree and, in certain circumstances, strict compliance with anti-corruption, anti-bribery, and anti-kickback laws may conflict with local customs and practices. We also, from time to time, undertake business ventures with state-owned companies or enterprises.

Our global business operations must also comply with all applicable domestic and foreign export control laws, including International Traffic in Arms Regulations (ITAR) and Export Administration Regulations (EAR). Some items we manufacture are controlled for export by the U.S. Department of Commerce's Bureau of Industry and Security under EAR.

We train our employees concerning anti-corruption, anti-bribery, and anti-kickback laws and compliance with international regulations regarding trades and exports, and we have policies in place that prohibit employees from making improper payments. We cannot provide assurances that our internal controls and procedures will guarantee compliance by our employees or third parties with whom we work. If we are found to be liable for violations of the FCPA or similar anti-corruption, anti-bribery, or anti-kickback laws in international jurisdictions or for violations of ITAR, EAR, or other similar regulations regarding trades and exports, either due to our own acts or out of inadvertence, or due to the inadvertence of others, we could suffer criminal or civil fines or penalties or other repercussions, including reputational harm, which could have a material adverse effect on our business, financial condition, and results of operations.

Our global business operations also must be conducted in compliance with applicable economic sanctions laws and regulations, such as laws administered by the U.S. Department of the Treasury's Office of Foreign Asset Control, the U.S. State Department, and the U.S. Department of Commerce. We must comply with all applicable economic sanctions laws and regulations of the United States and other countries. Imposition of economic sanction laws and regulations on a company or country could impact our revenue levels. Violations of these laws or regulations could result in significant additional sanctions including criminal or civil fines or penalties, more onerous compliance requirements, more extensive debarments from export privileges, or loss of authorizations needed to conduct aspects of our international business.

In certain countries, we may engage third-party agents or intermediaries, such as customs agents, to act on our behalf, and if these third-party agents or intermediaries violate applicable laws, their actions may result in criminal or civil fines or penalties or other sanctions being assessed against us. We take specific measures designed to ensure our compliance with U.S. export and economic sanctions laws, anti-corruption laws and regulations, and export control laws. However, it is possible that some of our products were sold or will be sold to distributors or other parties, without our knowledge or consent, in violation of applicable law. There can be no assurances that we will be in compliance in the future. Any such violation could result in significant criminal or civil fines, penalties, or other sanctions and repercussions, including reputational harm, which could have a material adverse effect on our business, financial condition, and results of operations.

Other Risks

We may need additional capital in the future to fund investments in our operations, refinance our indebtedness, and to maintain and grow our business, and such capital may not be available on a timely basis, on acceptable terms, or at all.

Our business is capital-intensive, and our ability to increase revenue, profit, and cash flow depends upon continued capital spending. To the extent that the funds generated by our ongoing operations are insufficient to cover our liquidity requirements, we may need to raise additional funds through financings. If we are unable to fund our operations and make capital expenditures as currently planned or if we do not have sufficient liquidity to service the interest and principal payments on our debt, it would have a material adverse effect on our business, financial condition, and results of operations. If we do not achieve our expected operating results, we would need to reallocate our sources and uses of operating cash flows. This may include borrowing additional funds to

service debt payments, which may impair our ability to make investments in our business. Looking ahead at long-term needs, we may need to raise additional funds for a number of purposes, including the following:

- to fund capital equipment purchases to increase production capacity, upgrade and expand our technological capabilities and replace aging equipment or introduce new products;
- to refinance our existing indebtedness;
- to fund our operations beyond 2021;
- to fund working capital requirements for future growth that we may experience;
- to enhance or expand the range of services we offer;
- to increase our sales and marketing activities; or
- to respond to competitive pressures or perceived opportunities, such as investment, acquisition, and international expansion activities.

Should we need to raise funds through incurring additional debt, we may become subject to covenants even more restrictive than those contained in our current debt instruments. There can be no assurance that additional capital, including any future equity or debt financing, would be available on a timely basis, on favorable terms, or at all. If such funds are not available to us when required or on acceptable terms, our business, financial condition, and results of operations could be materially adversely affected.

Outages, computer viruses, break-ins, and similar events could disrupt our operations, and breaches of our security systems may cause us to incur significant legal and financial exposure.

We rely on information technology networks and systems, some of which are owned and operated by third parties, to collect, process, transmit, and store electronic information. In particular, we depend on our information technology infrastructure for a variety of functions, including worldwide financial reporting, inventory management, procurement, invoicing, and email communications. Any of these systems may be susceptible to outages due to fire, floods, power loss, telecommunications failures, hacking, terrorist attacks, and similar events. In addition, in the ordinary course of our business, we collect and store sensitive data in our data centers and on our networks, including intellectual property, our proprietary and confidential business information and that of our customers, suppliers and business partners, and personally identifiable information of our employees. The secure collection, processing, storage, maintenance and transmission of this information is critical to our operations. Despite the implementation of network security measures, our systems and those of third parties on which we rely may also be vulnerable to computer viruses, break-ins, cyber-attacks, attacks by hackers or breaches due to employee or third party (including suppliers and business partners) error, malfeasance or other disruptions. If we or our vendors are unable to prevent such outages and breaches, our operations could be disrupted. If unauthorized parties gain access to our information systems or such information is used in an unauthorized manner, misdirected, altered, lost, or stolen during transmission, any theft or misuse of such information could result in, among other things, unfavorable publicity, governmental inquiry and oversight, difficulty in marketing our services, allegations by our customers that we have not performed our contractual obligations, loss of customers, litigation by affected parties, and possible financial obligations for damages related to the theft or misuse of such information, any of which could have a material adverse effect on our business, financial condition, and results of operations.

Issues arising during the upgrade of our enterprise resource planning system could affect our operating results and ability to manage our business effectively.

We are continuing the process of upgrading our enterprise resource planning, or ERP, management system to enhance operating efficiencies and provide more effective management of our business operations. We are investing significant financial and personnel resources into this project. However, there is no assurance that the system upgrade will meet our current or future business needs or that it will operate as designed. The transition to the new ERP system will affect numerous systems necessary for our operation. If we fail to correctly implement one or more components of the ERP system, we could experience significant disruption to our operations. Such disruptions could include, among other things, temporary loss of data, inability to process certain orders, failure of systems to communicate with each other and the inability to track or reconcile key data. We are heavily dependent on automated management systems, and any significant failure or delay in the system upgrade could cause a substantial interruption to our business and additional expense, which could result in an adverse impact on our operating results, cash flows or financial condition.

Our ability to use net operating loss carryforwards to offset future taxable income for U.S. federal, state and foreign income tax purposes is subject to limitations, and future transfers of shares of our common stock could cause us to experience an “ownership change” that could further limit our ability to utilize our net operating losses.

Under U.S. federal income tax law, a corporation’s ability to utilize its net operating losses (NOL’s) to offset future taxable income may be significantly limited if it experiences an “ownership change” as defined in Section 382 of the Internal Revenue Code of 1986, as amended. In general, an ownership change will occur if there is a cumulative change in a corporation’s ownership by “5-percent shareholders” that exceeds 50 percentage points over a rolling three-year period.

A corporation that experiences an ownership change will generally be subject to an annual limitation on its pre-ownership change NOLs equal to the value of the corporation immediately before the ownership change, multiplied by the long-term tax-exempt rate (subject to certain adjustments). The annual limitation for a taxable year is generally increased by the amount of any “recognized built-in gains” for such year and the amount of any unused annual limitation in a prior year. As a result of our acquisition of Viasystems, the NOLs acquired were subject to this limitation. Future transfers or sales of our common stock during a rolling three-year period by any of our “5-percent shareholders” could cause us to experience an ownership change under Section 382, which could further limit our use of NOL.

If our net earnings do not remain at or above recent levels, or we are not able to predict with a reasonable degree of probability that they will continue, we may have to record a valuation allowance against our net deferred income tax assets.

Our U.S. entities and certain of our foreign subsidiaries have deferred income tax assets. Based on our forecast for future taxable earnings, we believe we will utilize the deferred income tax assets in future periods except with respect to certain amounts where we have recorded valuation allowances. If our estimates of future earnings decline, we may have to increase our valuation allowance against our net deferred income tax assets, resulting in a higher income tax provision, which would reduce our results of operations.

Unanticipated changes in our tax rates or in our assessment of the realizability of our deferred income tax assets or exposure to additional income tax liabilities could affect our business, financial condition, and results of operations.

We are subject to income taxes in the United States and various foreign jurisdictions. Significant judgment is required in determining our provision for income taxes and, in the ordinary course of business, there are many transactions and calculations in which the ultimate tax determination is uncertain. Our effective tax rates could be materially adversely affected by changes in the mix of earnings in countries and states with differing statutory tax rates, changes in the valuation of deferred income tax assets and liabilities, changes in tax laws, as well as other factors. Our tax determinations are regularly subject to audit by tax authorities, and developments in those audits could adversely affect our income tax provision. Although we believe that our tax estimates are reasonable, the final determination of tax audits or tax disputes may be different from what is reflected in our historical income tax provisions, which could materially adversely affect our business, financial condition, and results of operations.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The following table describes our headquarters and our principal manufacturing facilities.

U.S. Locations	Operating Segment	Leased Square Feet	Owned Square Feet	Total Square Feet
Anaheim, CA (ANA)	PCB	—	96,000	96,000
Chippewa Falls, WI (CF)	PCB	—	281,000	281,000
Forest Grove, OR (FG)	PCB	12,774	217,950	230,724
Littleton, CO (DEN)	PCB	54,590	63,210	117,800
Logan, UT (LG)	PCB	12,000	118,448	130,448
North Jackson, OH (NJ)	PCB	8,800	85,000	93,800
Salem, NH (SAL)	PCB	43,700	—	43,700
San Diego, CA (SD)	PCB	43,336	—	43,336
San Jose, CA (SJ)	PCB	42,434	—	42,434
Santa Ana, CA (1)	Headquarters	14,472	—	14,472
Santa Ana, CA (SA)	PCB	9,416	82,550	91,966
Santa Clara, CA (SC)	PCB	21,966	45,685	67,651
Stafford, CT (ST)	PCB	—	126,924	126,924
Stafford Springs, CT (SS)	PCB	30,251	69,328	99,579
Sterling, VA (STE)	PCB	100,896	—	100,896
Syracuse, NY (SYR) (2)	PCB and RF&S Components	37,639	160,000	197,639
Total		432,274	1,346,095	1,778,369

Foreign Locations	Operating Segment	Leased Square Feet	Owned Square Feet	Total Square Feet
Canada				
Toronto (TOR)	PCB	15,500	99,960	115,460
China				
Dongguan (DMC)	PCB	—	1,069,129	1,069,129
Guangzhou (GZ)	PCB	—	2,237,318	2,237,318
Hong Kong (1)	Asia Headquarters	—	24,640	24,640
Hong Kong (OPCM)	PCB	—	128,432	128,432
Huiyang (HY)	PCB	—	503,935	503,935
Shanghai (SH)	E-M Solutions	85,745	—	85,745
Shanghai (SH E-MS) (3)	E-M Solutions	—	402,200	402,200
Shenzhen (SZ) (3)	E-M Solutions	430,000	—	430,000
Suzhou (SUZ)	RF&S Components	56,853	—	56,853
Zhongshan (ZS)	PCB	—	1,198,368	1,198,368
Total		588,098	5,663,982	6,252,080

We maintain our properties in good operating condition. We believe that our properties are suitable and adequate for us to operate at present levels, and the productive capacity and extent of utilization of the facilities are appropriate for our existing manufacturing requirements.

(1) Location of our headquarters and not a manufacturing facility

(2) Location includes two manufacturing facilities

(3) Facilities operated for most of 2020 until closure in the fourth quarter of 2020

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become a party to various legal proceedings arising in the ordinary course of our business. There can be no assurance that we will prevail in any such litigation. We believe that the amount of any reasonably possible or probable loss for known matters would not be material to our financial statements; however, the outcome of these actions is inherently difficult to predict. In the event of an adverse outcome, the ultimate potential loss could have a material adverse effect on our financial condition, results of operations, or cash flows in a particular period.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock has been listed on the Nasdaq Global Select Market under the symbol “TTMI” since September 21, 2000.

As of February 17, 2021, there were approximately 281 holders of record of our common stock. The closing sale price of our common stock on the Nasdaq Global Select Market on February 17, 2021 was \$14.33.

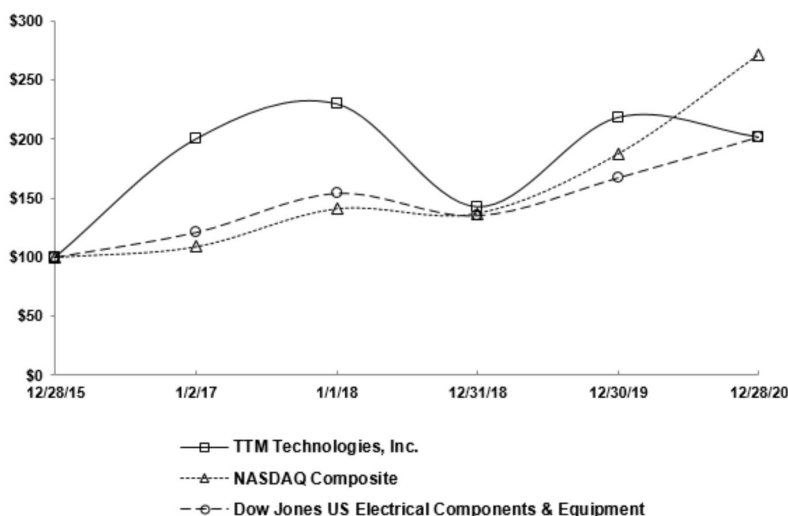
STOCK PRICE PERFORMANCE GRAPH

The performance graph below compares, for the period from December 28, 2015 to December 28, 2020, the cumulative total stockholder return on our common stock against the cumulative total return of:

- the NASDAQ Composite Index; and
- the Dow Jones U.S. Electrical Components & Equipment Index.

The graph assumes \$100 was invested in our common stock on December 28, 2015, and an investment in NASDAQ Composite Index and the Dow Jones US Electrical Components & Equipment Index. The stock performance shown on the graph below represents historical stock performance and is not necessarily indicative of future stock performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
Among TTM Technologies, Inc., the NASDAQ Composite Index and the Dow Jones US Electrical Components & Equipment Index



* \$100 invested on December 28, 2015 in stock or index, including reinvestment of dividends.

	12/28/2015	1/2/2017	1/1/2018	12/31/2018	12/30/2019	12/28/2020
TTM Technologies, Inc.	\$ 100.00	\$ 200.15	\$ 230.10	\$ 142.88	\$ 218.50	\$ 201.91
NASDAQ Composite	100.00	108.87	141.13	137.12	187.44	271.64
Dow Jones US Electrical Components & Equipment	100.00	120.99	154.21	135.29	167.34	202.05

The performance graph above shall not be deemed “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section. The performance graph above will not be deemed incorporated by reference into any filing of our company under the Securities Act of 1933, as amended, or the Exchange Act.

Dividends

We have never declared or paid cash dividends on our common stock. We currently expect to retain future earnings for use in capital expenditures, for acquisitions, fund working capital requirements, repay existing debt, and potentially for share repurchases

and do not anticipate paying cash dividends in the foreseeable future. Additionally, our ability to pay dividends is limited pursuant to covenants contained in our various debt agreements.

ITEM 6. *SELECTED FINANCIAL DATA*

Omitted pursuant to our election to apply rules adopted by the SEC effective February 10, 2021 to eliminate Item 301 of Regulation S-K.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This financial review presents our operating results for each of our three most recent fiscal years and our financial condition as of December 28, 2020. Except for historical information contained herein, the following discussion contains forward-looking statements which are subject to known and unknown risks, uncertainties and other factors that may cause our actual results to differ materially from those expressed or implied by such forward-looking statements. We discuss such risks, uncertainties and other factors throughout this report and specifically under Item 1A of Part I of this report, Risk Factors. In addition, the following discussion should be read in connection with the information presented in our consolidated financial statements and the related notes to our consolidated financial statements.

COMPANY OVERVIEW

We are a leading global printed circuit board (PCB) manufacturer, focusing on quick-turn and volume production of technologically advanced PCBs and backplane assemblies as well as a global designer and manufacturer of high-frequency radio frequency (RF) and microwave components and assemblies. We focus on providing time-to-market and volume production of advanced technology products and offer a one-stop design, engineering and manufacturing solution to our customers. This one-stop design, engineering and manufacturing solution allows us to align technology development with the diverse needs of our customers and to enable them to reduce the time required to develop new products and bring them to market. We serve a diversified customer base consisting of approximately 1,600 customers in various markets throughout the world, including aerospace and defense, computing, automotive components, medical, industrial and instrumentation related products, as well as networking/communications infrastructure products. Our customers include both original equipment manufacturers (OEMs) and electronic manufacturing services (EMS) providers.

RECENT DEVELOPMENTS

The recent coronavirus (COVID-19) pandemic first caused business disruption in our operations in China beginning in January 2020. By March 2020, the situation escalated as the scope of the COVID-19 pandemic worsened outside of the Asia-Pacific region, with Europe and North America being affected by the pandemic. Also, we experienced an increase in COVID-19 cases in our facilities in North America during the fourth quarter of 2020. As a result, we expect continued impacts on our production, as well as ongoing significant uncertainty relating to the actual and potential impacts of the COVID-19 pandemic, and we cannot reasonably estimate its duration or severity. The COVID-19 pandemic has created and continues to create various global macroeconomic, customer demand, operational and supply chain risks any one of which could have a material and adverse impact on our business going forward. See Item 1A, *Risk Factors*, of Part I above for further information related to the COVID-19 pandemic. We have taken measures to protect our employees, suppliers and customers by implementing our pandemic recovery protocols, establishing situational leadership teams in Asia-Pacific and North America along with regularly scheduled executive review and planning calls, implementing global travel restrictions, and conforming to the guidance and direction of local governments and global health organizations. We are monitoring the impacts the COVID-19 pandemic has had, and continues to have, on our supply chain and are collaborating with our third-party partners with the goal of mitigating, to the extent reasonably practicable, significant delays in delivery of our products.

FINANCIAL OVERVIEW

On April 17, 2020, we completed the sale of our Mobility business unit for a final purchase price of \$569.2 million, received pre-tax proceeds from the sale, net of cash disposed of \$507.5 million, and recorded a gain on the sale before income taxes of \$237.3 million. The final purchase price of \$569.2 million did not include approximately \$83.0 million of accounts receivable of the divested business. Results related to our Mobility business unit are reported as discontinued operations for all periods presented. See Note 3 of the Notes to Consolidated Financial Statements for further information. Unless otherwise noted, amounts and disclosures throughout our Management's Discussion and Analysis of Financial Condition and Results of Operations relate to our continuing operations.

While our customers include both OEMs and EMS providers, we measure customers based on OEM companies, as they are the ultimate end customers. Sales to our five largest customers accounted for 29%, 27% and 25% of our net sales in fiscal years 2020, 2019 and 2018, respectively. We sell to OEMs both directly and indirectly through EMS providers.

The following table shows the percentage of our net sales attributable to each of the principal end markets we served for the periods indicated:

End Markets (1)	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018 (3)
Aerospace and Defense	36 %	33 %	27 %
Automotive	15	19	21
Computing/Storage/Peripherals	12	11	13
Medical/Industrial/Instrumentation	18	17	17
Networking/Communications	18	18	21
Other (2)	1	2	1
Total	100 %	100 %	100 %

(1) Sales to EMS companies are classified by the end markets of their OEM customers.

(2) Other consumer devices that include wearables, portable video devices and personal headphones are included in the Other end market.

(3) Amounts include activity of Anaren since the acquisition which occurred on April 18, 2018.

We derive revenues primarily from the sale of PCBs, custom electronic assemblies using customer-supplied engineering and design plans as well as our long-term contracts related to the design and manufacture of RF and microwave components, assemblies and subsystems. Orders for products generally correspond to the production schedules of our customers and are supported with firm purchase orders. Our customers have continuous control of the work in progress and finished goods throughout the PCB and custom electronic assemblies manufacturing process, as these are built to customer specifications with no alternative use, and there is an enforceable right of payment for work performed to date. As a result, we recognize revenue progressively over time based on the extent of progress towards completion of the performance obligation. We recognize revenue based on the cost-to-cost method as it best depicts the transfer of control to the customer which takes place as we incur costs. Under the cost-to-cost measure of progress, the extent of progress toward completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. Revenues are recorded proportionally as costs are incurred.

We also manufacture certain components, assemblies, and subsystems which service our RF and Specialty Components (RF&S Components) customers. We recognize revenue at a point in time upon transfer of control of the products to our customer. Point in time recognition was determined as our customers do not simultaneously receive or consume the benefits provided by our performance and the asset being manufactured has alternative uses to us.

Net sales consist of gross sales less an allowance for returns, which typically have been approximately 2% of gross sales. We provide our customers a limited right of return for defective PCBs including components, subsystems and assemblies. We record an estimate for sales returns and allowances at the time of sale based on historical results and anticipated returns.

Cost of goods sold consists of materials, labor, outside services, and overhead expenses incurred in the manufacture and testing of our products. Shipping and handling fees and related freight costs and supplies associated with shipping products are also included as a component of cost of goods sold. Many factors affect our gross margin, including capacity utilization, product mix, production volume, and yield. While we have entered into supply assurance agreements with some of our key suppliers to maintain the continuity of supply of some of the key materials we use, we generally do not participate in any significant long-term contracts with suppliers, and we believe there are a number of potential suppliers for most of the raw materials we use.

Selling and marketing expenses consist primarily of salaries, labor related benefits, and commissions paid to our internal sales force, independent sales representatives, and our sales support staff, as well as costs associated with marketing materials and trade shows.

General and administrative costs primarily include the salaries for executive, finance, accounting, information technology, facilities, and human resources personnel, as well as expenses for accounting and legal assistance, incentive compensation expense, and gains or losses on the sale or disposal of property, plant and equipment.

Research and development expenses consist primarily of salaries and labor related benefits paid to our research and development staff, as well as material costs.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our consolidated financial statements included in this report have been prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP). The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, net sales and expenses, and related disclosure of contingent assets and liabilities.

A critical accounting policy is defined as one that is both material to the presentation of our consolidated financial statements and requires us to make judgments that could have a material effect on our financial condition or results of operations. These policies require us to make assumptions about matters that are highly uncertain at the time of the estimate. Different estimates we could

reasonably have used, or changes in the estimates that are reasonably likely to occur, could have a material effect on our financial condition or results of operations.

We base our estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Management has discussed the development, selection and disclosure of these estimates with the audit committee of our board of directors. Actual results may differ from these estimates under different assumptions or conditions.

Our critical accounting policies include impairment of goodwill and intangible assets and realizability of deferred tax assets.

Goodwill and Intangible Assets

We have significant goodwill and definite-lived intangibles. We review these assets for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. In addition, we perform an impairment test related to goodwill at least annually. As necessary, we make judgments regarding future cash flow forecasts in the assessment of impairment.

Goodwill is allocated to our reporting units, which are our operating segments or one level below our operating segments (the component level). Reporting units are determined by the discrete financial information available for the component and whether it is regularly reviewed by segment management. Components are aggregated into a single reporting unit if they share similar economic characteristics. The Company evaluates its goodwill on an annual basis in the fourth quarter or more frequently if it believes indicators of impairment exist. We assess 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 or perform an annual impairment test. When tested quantitatively, we compare the fair value of the applicable reporting unit with its carrying value. We estimate the fair values of our reporting units using a combination of the discounted cash flow (DCF) and market approach. If the carrying amount of a reporting unit exceeds the reporting unit's fair value, the amount by which the carrying value exceeds the fair value is recognized as an impairment loss.

During the year ended December 28, 2020, our RF&S Components operating segment met the quantitative threshold for separate presentation of a reportable segment. In prior periods, we had two reportable segments consisting of PCB and E-M Solutions. The RF&S Components reportable segment was previously aggregated with the PCB reportable segment. Goodwill is only attributable to our PCB and RF&S Components reportable segments. During the third quarter of 2020, we determined that there was a permanent loss of sales due to certain government restrictions on the sale of U.S.-designed products to certain customers in China in the RF&S Components reporting unit that coupled with the impact of COVID-19, resulted in lower than anticipated results and continued decline in sales. We considered these factors to be indicators of potential impairment requiring us to test the related goodwill of \$177.2 million for impairment. As of September 28, 2020, we completed a quantitative goodwill impairment analysis related to our RF&S Components reporting unit by comparing the fair value of the reporting unit with its carrying amount. We determined the fair value of the reporting unit by using both a discounted cash flow (DCF) and a market approach. Under the market approach, we used revenue and earnings multiples based on comparable industry multiples to estimate the fair value of the reporting unit.

Under the DCF approach, we estimated the future cash flows, as well as selected a risk-adjusted discount rate to measure the present value of the anticipated cash flows. When determining future cash flow estimates, we considered historical results adjusted to reflect current and anticipated future operating conditions. We estimated cash flows for the reporting unit over a discrete period and a terminal period (considering expected long-term growth rates and trends).

Based on our analysis, we determined that the fair value of the RF&S Components reporting unit was less than its carrying value and recorded a goodwill impairment charge of \$69.2 million. Estimating the fair value of the reporting unit requires us to make assumptions and estimates in such areas as future economic conditions, industry-specific conditions, product pricing, and necessary capital expenditures. The use of different assumptions or estimates for future cash flows, discount rates, or terminal growth rates could produce substantially different estimates of the fair value of the reporting unit. We may be subject to additional goodwill impairment charges if actual results do not meet the estimates used in determining the fair value of goodwill and the associated goodwill impairment charge.

During the fourth quarter of 2020, we changed the date of our annual impairment test of goodwill from year-end to the first day of fiscal November to provide for additional time to complete the required impairment testing. This change does not represent a material change to our method of applying an accounting principle. The change in annual impairment test date has been prospectively applied beginning the first day of fiscal November 2020. In the fourth quarter of 2020, we performed our annual impairment test qualitatively and concluded that it was more likely than not that goodwill was not impaired. Management will continue to monitor the reporting units for changes in the business environment that could impact recoverability. The recoverability of goodwill is dependent upon the continued growth of cash flows from our business activities. If the economy or business environment falter and we are unable to achieve our assumed revenue growth rates or profit margin percentages, our projections used would need to be re-measured, which could impact the carrying value of our goodwill in one or more of our reporting units.

We also assess definite-lived intangibles for potential impairment given similar impairment indicators. When indicators of impairment exist related to our definite-lived intangible assets, we use an estimate of the undiscounted cash flows in measuring whether the carrying amount of the assets is recoverable. If the sum of the undiscounted cash flows is less than the carrying amount of the net assets, impairment is measured based on the difference between the net asset's carrying value and estimated fair value. Fair

value is determined through various valuation techniques, including cost-based, market and income approaches as considered necessary, which involve judgments related to future cash flows and the application of the appropriate valuation model.

Income Taxes

Deferred income tax assets are reviewed for recoverability, and valuation allowances are provided, when necessary, to reduce deferred income tax assets to the amounts that are more likely than not to be realized based on our estimate of future taxable income. As of December 28, 2020, we had a net non-current deferred income tax asset of \$16.6 million, which is comprised of a net deferred tax asset of \$111.1 million and a net deferred tax liability of \$94.5 million. As of December 28, 2020, our deferred income tax asset of \$111.1 million was net of a valuation allowance of approximately \$15.3 million. Should our expectations of taxable income change in future periods, it may be necessary to adjust our valuation allowance, which could affect our results of operations in the period such a determination is made.

We are subject to income taxes in the United States and foreign jurisdictions. Significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of our business, there are many transactions for which the ultimate tax determination is uncertain. Additionally, our calculations of income taxes are based on our interpretations of applicable tax laws in the jurisdictions in which we file.

RESULTS OF OPERATIONS

We operate on a 52 or 53 week year ending on the Monday nearest December 31. Fiscal year 2020, 2019 and 2018 were 52 weeks ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

The following table sets forth the relationship of various items to net sales in our consolidated statements of operations:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
Net sales	100.0 %	100.0 %	100.0 %
Cost of goods sold	83.0	82.3	82.0
Gross profit	17.0	17.7	18.0
Operating expenses:			
Selling and marketing	3.0	3.2	3.1
General and administrative	5.8	6.1	6.2
Research and development	1.0	0.8	0.6
Amortization of definite-lived intangibles	1.8	2.2	2.6
Restructuring charges	0.8	0.3	0.2
Impairment of goodwill	3.3	—	—
Total operating expenses	15.7	12.6	12.7
Operating income	1.3	5.1	5.3
Other (expense) income:			
Interest expense	(3.5)	(3.8)	(3.4)
Other, net	—	0.3	0.2
Total other expense, net	(3.5)	(3.5)	(3.2)
(Loss) income from continuing operations before income taxes	(2.2)	1.6	2.1
Income tax (provision) benefit	1.4	(0.1)	3.9
Net (loss) income from continuing operations	(0.8) %	1.5 %	6.0 %

The Anaren acquisition occurred on April 18, 2018. Accordingly, our fiscal year 2018 only includes Anaren's 2018 results of operations since the acquisition date.

During the year ended December 28, 2020, our RF&S Components operating segment met the quantitative threshold for separate presentation of a reportable segment. In prior periods, we had two reportable segments: PCB and E-M Solutions. The RF&S Components reportable segment was previously aggregated with the PCB reportable segment. As a result, we now report on all three segments, and certain prior year amounts have been reclassified to conform with this new presentation.

Net Sales

Total net sales decreased \$27.9 million, or 1.3%, to \$2,105.3 million for the year ended December 28, 2020 from \$2,133.2 million for the year ended December 30, 2019. This decrease primarily resulted from a decrease in net sales for the E-M Solutions reportable segment of \$70.9 million, or 31.3%, to \$155.4 million for the year ended December 28, 2020 from \$226.3 million for the year ended December 30, 2019, primarily due to the winding down of this reportable segment and lower demand in our Automotive end market. Also contributing to the decrease in total net sales was a decrease in net sales for the RF&S Components reportable segment of \$17.7 million, or 28.3%, to \$44.7 million for the year ended December 28, 2020 from \$62.3 million for the year ended

December 30, 2019. The decrease in RF&S Components net sales was primarily due to restrictions on the sale of U.S.-designed products to certain customers in China which, coupled with the impact of COVID-19, resulted in lower demand in our Networking/Communications and Other end markets. The decrease in total net sales was partially offset by an increase in net sales for the PCB reportable segment of \$60.7 million, or 3.3%, to \$1,905.2 million for the year ended December 28, 2020 from \$1,844.6 million for the year ended December 30, 2019. The increase in PCB net sales was primarily due to increased demand in our Aerospace and Defense, Medical/Industrial/Instrumentation, and Computing/Storage/Peripherals end markets, partially offset by lower demand in our Automotive end market. Also driving the increase in PCB net sales were changes in product mix, which resulted in an increase in the average price per square foot of 15.2%. The benefit of this price increase, however, was partially offset by a 10.1% decrease in the volume of PCB shipments as compared to the year ended December 30, 2019.

Total net sales decreased \$104.5 million, or 4.7%, to \$2,133.2 million for the year ended December 30, 2019 from \$2,237.7 million for the year ended December 31, 2018. Net sales for the PCB reportable segment decreased \$114.5 million, or 5.9%, to \$1,844.6 million for the year ended December 30, 2019 from \$1,959.1 million for the year ended December 31, 2018. The reduction in PCB net sales was primarily due to lower demand in our commercial (non-Aerospace and Defense related) end markets, partially offset by increased demand in our Aerospace and defense end market, which was primarily the result of the impact in the fiscal year 2019 of our acquisition of Anaren (which occurred on April 18, 2018) and higher demand at our other Aerospace and Defense focused facilities. These changes resulted in a 19.6% decrease in the volume of PCB shipments partially offset by an average PCB selling price increase of 13.0%, driven mainly by product mix shift, as compared to the year ended December 31, 2018. Net sales for the RF&S Components reportable segment increased \$9.6 million, or 18.2% to \$62.3 million for the year ended December 30, 2019 from \$52.7 million for the year ended December 31, 2018. The increase was primarily the result of the impact in the fiscal year 2019 of our acquisition of Anaren (which occurred on April 18, 2018). Net sales for the E-M Solutions reportable segment increased \$0.4 million, or 0.2%, to \$226.3 million for the year ended December 30, 2019 from \$225.9 million for the year ended December 31, 2018.

For information regarding net sales by country, see Note 17 of the Notes to Consolidated Financial Statements.

Gross Margin

Overall gross margin decreased to 17.0% for the year ended December 28, 2020 from 17.7% for the year ended December 30, 2019. The decrease in overall gross margin was due to the decrease in gross margin for the RF&S Components and E-M Solutions reportable segment to 45.9% and 1.8%, respectively, for the year ended December 28, 2020 from 63.2% and 7.2%, respectively, for the year ended December 30, 2019, primarily due to lower sales. The lower sales of RF&S Components products was mainly due to restrictions on the sale of U.S.-designed products to certain customers in China. This decrease was partially offset by the gross margin for the PCB reportable segment, which increased to 18.5% for the year ended December 28, 2020 from 18.3% for the year ended December 30, 2019, primarily due to higher volumes at our Aerospace and Defense facilities.

Overall gross margin decreased to 17.7% for the year ended December 30, 2019 from 18.0% for the year ended December 31, 2018. Gross margin for the PCB reportable segment decreased to 18.3% for the year ended December 30, 2019 from 18.5% for the year ended December 31, 2018, primarily due to lower volumes in our commercially focused facilities. Furthermore, gross margin for the RF&S Components and E-M Solutions reportable segments decreased to 63.2% and 7.2%, respectively, for the year ended December 30, 2019 from 64.4% and 8.0%, respectively, for the year ended December 31, 2018, in each case primarily due to mix shift toward higher direct material content work.

Capacity utilization is a key driver for us, which is measured by the actual production as a percentage of maximum capacity. This measure is particularly important in our high volume facilities in Asia, as a significant portion of our operating costs are fixed in nature. Capacity utilization for the year ended December 28, 2020 in our Asia and North America PCB facilities was 62% and 62%, respectively, compared to 61% and 60%, respectively, for the year ended December 30, 2019. The increase in capacity utilization in our Asia and North America PCB facilities was due to an increase in production related to increased sales in our Aerospace and Defense, Medical/Industrial/Instrumentation, and Computing/Storage/Peripherals end markets.

Selling and Marketing Expenses

Selling and marketing expenses decreased \$5.3 million to \$63.9 million for the year ended December 28, 2020 from \$69.2 million for the year ended December 30, 2019. As a percentage of net sales, selling and marketing expenses were 3.0% for the year ended December 28, 2020 as compared to 3.2% for the year ended December 30, 2019. The decrease in selling and marketing expenses in 2020 was primarily due to reduced travel expense and other costs as a result of the COVID-19 pandemic, which has decreased travel on a temporary basis and commission expense.

Selling and marketing expenses decreased \$0.9 million to \$69.2 million for the year ended December 30, 2019 from \$70.1 million for the year ended December 31, 2018. As a percentage of net sales, selling and marketing expenses were 3.2% for the year ended December 30, 2019 as compared to 3.1% for the year ended December 31, 2018. The decrease in selling and marketing expenses in 2019 was primarily due to reduced travel expenses.

General and Administrative Expenses

General and administrative expenses decreased \$6.8 million to \$122.5 million, or 5.8% of net sales, for the year ended December 28, 2020 from \$129.3 million, or 6.1% of net sales, for the year ended December 30, 2019. This decrease was primarily due to a decrease in acquisition costs and cost reduction efforts as a result of the COVID-19 pandemic.

General and administrative expenses decreased \$9.0 million to \$129.3 million, or 6.1% of net sales, for the year ended December 30, 2019 from \$138.3 million, or 6.2% of net sales, for the year ended December 31, 2018. This decrease in expense was primarily due to the decrease in acquisition-related costs of \$6.4 million primarily associated with the acquisition of Anaren on April 18, 2018 and a decrease of \$8.9 million primarily due to stock-based compensation and incentive compensation expense, partially offset by \$6.4 million for the additional three and a half months of general and administrative expense associated with operations acquired in the Anaren acquisition in 2019 (which occurred on April 18, 2018).

Restructuring Charges

For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, we incurred restructuring charges of \$16.8 million, \$5.4 million and \$4.7 million, respectively, related to the restructuring of our E-M Solutions business unit and other global realignment restructuring efforts.

For the year ended December 28, 2020, we recognized restructuring charges of \$16.6 million and \$0.2 million in our E-M Solutions reportable segment and Corporate, respectively. For the year ended December 30, 2019, we recognized restructuring charges of \$5.2 million and \$0.1 million in our PCB and RF&S Components reportable segments, respectively, and \$0.1 million in Corporate. For the year ended December 31, 2018, we recognized restructuring charges of \$1.2 million and \$3.5 million in our PCB reportable segment and Corporate, respectively. These charges primarily represent employee separation and contract termination and other costs associated with the restructuring plans.

Impairment of Goodwill

For the year ended December 28, 2020, we recorded a goodwill impairment charge of \$69.2 million. See Note 5 of the Notes to Consolidated Financial Statements for further information.

Other Expense

Other expense, net decreased \$0.9 million to \$74.4 million for the year ended December 28, 2020 from \$75.3 million for the year ended December 30, 2019. The decrease in other expense, net was primarily due to:

- a decrease in interest expense of \$8.9 million mainly as a result of a \$400.0 million debt principal prepayment for the Term Loan made during the year ended December 28, 2020 and lower interest rates,
- partially offset by an increase in foreign currency losses due to the strengthening of the Chinese Renminbi (RMB) during the year ended December 28, 2020 compared to the year ended December 30, 2019. We utilize the RMB at our China facilities for employee-related expenses, RMB denominated purchases, and other costs of running our operations in China.

Other expense, net increased \$3.5 million to \$75.3 million for the year ended December 30, 2019 from \$71.8 million for the year ended December 31, 2018. The increase in other expense, net was primarily due to:

- an increase in interest expense of \$6.3 million, primarily related to the \$600.0 million incremental debt incurred in conjunction with the Anaren acquisition,
- partially offset by an increase in other income related to the sale of other assets of \$4.0 million.

Income Taxes

The provision for income taxes decreased \$32.3 million to an income tax benefit of \$29.9 million for the year ended December 28, 2020 from an income tax expense of \$2.4 million for the year ended December 30, 2019. The change in income tax from an expense to a benefit in 2020 was primarily due to the release of uncertain tax positions in 2020 totaling \$34.7 million as a result of statute of limitation expirations and the conclusion of a tax exam. This was partially offset by tax expense related to the retroactive approval of the Company's renewal application for High and New Tax Enterprise status for one of the Company's manufacturing subsidiaries in China (including the impact on the respective Company's deferred tax assets) and by an increase in the deferred tax liability related to unremitted foreign earnings.

Our effective tax rate is primarily impacted by tax rates in China and Hong Kong, the US federal income tax rate, apportioned state income tax rates, generation of credits and deductions available to us, as well as changes in valuation allowances, certain non-deductible items, global intangible low taxed income, and the establishment of a deferred tax liability related to unremitted foreign earnings.

The provision for income taxes increased \$90.6 million to an income tax expense of \$2.4 million for the year ended December 30, 2019 from an income tax benefit of \$88.2 million for the year ended December 31, 2018. The increase in income tax expense in 2019 was primarily due to the absence of a \$121.4 million release of the Company's valuation allowance against its net deferred tax assets in 2018, partially offset by a reduction in the deferred tax liability related to unremitted foreign earnings and tax benefits resulted from decreased income before income taxes.

Liquidity and Capital Resources

Our principal sources of liquidity have been cash provided by operations, the issuance of debt, and borrowings under our Revolving Credit Facility. Our principal uses of cash have been to finance capital expenditures, finance acquisitions, fund working capital requirements, and to repay existing debt. We anticipate that financing capital expenditures, financing acquisitions, funding working capital requirements, servicing debt, and potential share repurchases will be the principal demands on our cash in the future.

Cash flow provided by operating activities for continuing operations during the year ended December 28, 2020 was \$247.7 million as compared to \$295.8 million in the same period in 2019. The decrease in cash flow was primarily due to decrease in net income of \$48.3 million.

Net cash used in investing activities for continuing operations was approximately \$93.6 million for the year ended December 28, 2020 comprised primarily of purchases of property, plant and equipment and other assets. Net cash used in investing activities was approximately \$111.8 million for the year ended December 30, 2019 primarily reflecting \$118.0 million for purchases of property, plant and equipment and other assets less proceeds from sale of property, plant and equipment and other assets of \$6.2 million.

Net cash used in financing activities for continuing operations during the year ended December 28, 2020 was \$642.3 million, primarily reflecting repayment of long-term debt of \$650.0 million. Net cash used in financing activities was approximately \$31.8 million for the year ended December 30, 2019, primarily reflecting repayment of long-term debt of \$30.0 million and payment of debt issuance costs of \$1.8 million.

We received pre-tax proceeds from the sale of the Mobility business unit, net of cash disposed, of \$507.5 million during the year ended December 28, 2020, which have been presented in the consolidated statements of cash flows within net cash provided by investing activities from discontinued operations.

As of December 28, 2020, we had cash and cash equivalents of approximately \$451.6 million, of which approximately \$221.4 million was held by our foreign subsidiaries, primarily in China. Should we choose to remit cash to the United States from our foreign locations, we may incur tax obligations which would reduce the amount of cash ultimately available to the United States. However, we believe there would be no material tax consequences not previously accrued for on the repatriation of this cash.

Our 2021 capital expenditure plan is expected to be in the range of \$90.0 million to \$110.0 million.

Long-term Debt and Letters of Credit

As of December 28, 2020, we had \$842.9 million of outstanding debt, net of discount and debt issuance costs, composed of \$402.4 million of Term Loan due September 2024, \$370.5 million of Senior Notes due October 2025, \$40.0 million under the U.S. Asset-Based Lending Credit Agreement (U.S. ABL), and \$30.0 million under the Asia Asset-Based Lending Credit Agreement (Asia ABL).

Pursuant to the terms of the Term Loan Facility and Senior Notes, we are subject to certain affirmative and negative covenants, including limitations on indebtedness, corporate transactions, investments, dispositions, and share payments. Under the occurrence of certain events, as a result of the ABL Revolving Loans, we are also subject to various financial and operational covenants, including maintaining minimum fixed charge coverage ratios. As of December 28, 2020, we were in compliance with the covenants under the Term Loan Facility, Senior Notes and ABL Revolving Loans.

Based on our current level of operations, we believe that cash generated from operations, cash on hand and cash from the issuance of term and revolving debt will be adequate to meet our currently anticipated capital expenditure, debt service, and working capital needs for the next twelve months. Additional information regarding our indebtedness, including information about the credit available under our debt facilities, interest rates and other key terms of our outstanding indebtedness, is included in Note 7 of the Notes to Consolidated Financial Statements included in this Annual Report on Form 10-K.

Contractual Obligations and Commitments

The following table provides information on our contractual obligations as of December 28, 2020:

	Total	Less Than 1 Year	1 - 3 Years	4 - 5 Years	After 5 Years
Contractual Obligations (1)			(In thousands)		
Long-term debt obligations	\$ 850,879	\$ —	\$ —	\$ 850,879	\$ —
Interest on debt obligations	149,856	33,211	65,964	50,681	—
Derivative liabilities	16,384	10,977	5,407	—	—
Purchase obligations	104,943	75,924	20,098	724	8,197
Total contractual obligations	\$ 1,122,062	\$ 120,112	\$ 91,469	\$ 902,284	\$ 8,197

(1) Unrecognized uncertain tax benefits of \$2.6 million are not included in the table above as the settlement timing is uncertain. Operating leases are not included in the table above – see Note 2 of the Notes to Consolidated Financial Statements for further details.

Off-Balance Sheet Arrangements

We do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. In addition, we do not engage in trading activities involving non-exchange traded contracts. As a result, we are not materially exposed to any financing, liquidity, market, or credit risk that could arise if we had engaged in these relationships.

Seasonality

Orders for our products generally correspond to the production schedules of our customers. We historically experience seasonal fluctuations in the first quarter due to the Chinese New Year holidays, which typically results in lower net sales for that quarter. We attribute this decline to shutdowns of our customers' and our own China based manufacturing facilities surrounding the Chinese New Year public holidays, which normally occur in January or February of each year.

Recently Issued Accounting Standards

For a description of recently adopted and issued accounting standards, including the respective dates of adoption and expected effects on our results of operations and financial condition, see Note 1 of the Notes to Consolidated Financial Statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

In the normal course of business operations, we are exposed to risks associated with fluctuations in interest rates and foreign currency exchange rates. We address these risks through controlled risk management that includes the use of derivative financial instruments to economically hedge or reduce these exposures. We do not enter into derivative financial instruments for trading or speculative purposes.

We have not experienced any losses to date on any derivative financial instruments due to counterparty credit risk.

To ensure the adequacy and effectiveness of our interest rate and foreign exchange hedge positions, we continually monitor our interest rate swap positions and foreign exchange forward positions, both on a stand-alone basis and in conjunction with their underlying interest rate and foreign currency exposures, from an accounting and economic perspective. However, given the inherent limitations of forecasting and the anticipatory nature of the exposures intended to be hedged, we cannot be assured that such programs will offset more than a portion of the adverse financial impact resulting from unfavorable movements in either interest or foreign exchange rates. In addition, the timing of the accounting for recognition of gains and losses related to mark-to-market instruments for any given period may not coincide with the timing of gains and losses related to the underlying economic exposures and, therefore, may adversely affect our consolidated operating results and financial position.

Interest Rate Risks

Our business is exposed to interest rate risk resulting from fluctuations in interest rates. Our interest expense is more sensitive to fluctuations in the general level of LIBOR interest rates than to changes in rates in other markets. Increases in interest rates would increase interest expense relating to our outstanding variable rate borrowings and increase the cost of debt. Fluctuations in interest rates can also lead to significant fluctuations in the fair value of our debt obligations.

On May 15, 2018, we entered into a four-year pay-fixed, receive floating (1-month LIBOR), interest rate swap arrangement with a notional amount of \$400.0 million for the period beginning June 1, 2018 and ending on June 1, 2022. Under the terms of the interest rate swap, we pay a fixed rate of 2.84% against the first interest payments of a portion of our LIBOR-based debt and receive floating 1-month LIBOR during the swap period. At inception, we designated the interest rate swap as a cash flow hedge and the fair value of the interest rate swap was zero. As of December 28, 2020, the fair value of the interest rate swap was recorded as a liability and as a

component of other long-term liabilities in the amount of \$15.0 million. No ineffectiveness was recognized for the year ended December 28, 2020. During the year ended December 28, 2020, the interest rate swap increased interest expense by \$8.9 million.

As of December 28, 2020, approximately 91.1% of our long-term debt was based on fixed rates. Based on our borrowings as of December 28, 2020, an assumed 100 basis point increase in variable rates would cause our annual interest cost to increase by \$0.8 million and an assumed 100 basis point decrease in variable rates would cause our annual interest cost to decrease by \$0.1 million.

On July 27, 2017, the Financial Conduct Authority announced the desire to phase out the use of LIBOR by the end of 2021, which may affect us adversely. If LIBOR is discontinued, we may need to renegotiate the terms of certain credit instruments, which utilize LIBOR as a benchmark in determining the interest rate, to replace LIBOR with the new standard that is established. There is currently no definitive information regarding the future utilization of LIBOR or of any particular replacement rate. As such, the potential effect of any such event on our cost of capital and net investment income cannot yet be determined.

Foreign Currency Risks

In the normal course of business, we are exposed to risks associated with fluctuations in foreign currency exchange rates related to transactions that are denominated in currencies other than our functional currencies, as well as the effects of translating amounts denominated in a foreign currency to the U.S. Dollar as a normal part of our financial reporting process. Most of our foreign operations have the U.S. Dollar as their functional currency, however, two of our China facilities utilize the Renminbi (RMB), which results in recognition of translation adjustments included as a component of other comprehensive loss. Our foreign exchange exposure results primarily from employee-related and other costs of running our operations in foreign countries, foreign currency denominated purchases and translation of balance sheet accounts denominated in foreign currencies. Our primary foreign exchange exposure is to the RMB. Except for certain equipment purchases, we do not engage in hedging to manage foreign currency risk. However, we may consider the use of derivatives in the future. In general, our Chinese customers pay us in RMB, which partially mitigates this foreign currency exchange risk.

We enter into foreign currency forward contracts to mitigate the impact of changes in foreign currency exchange rates and to reduce the volatility of purchases and other obligations generated in currencies other than our functional currencies. Our foreign subsidiaries may at times enter into forward exchange contracts to manage foreign currency risks in relation to certain purchases of machinery denominated in foreign currencies other than our functional currencies. The notional amount of the foreign exchange contracts as of December 28, 2020 and December 30, 2019 was approximately \$1.2 million (Japanese Yen (JPY) 125.0 million) and \$2.0 million (JPY 215.8 million), respectively. We designated certain of these foreign exchange contracts as cash flow hedges.

Debt Instruments

The table below presents the fiscal calendar maturities of long-term debt through 2025 and thereafter of our debt instruments as of December 28, 2020:

As of December 28, 2020										
	2021	2022	2023	2024 (1)	2025	Thereafter	Total	Fair Market Value	Weighted Average Interest Rate	
	(In thousands)									
US\$ Variable Rate	\$ —	\$ —	\$ —	\$ 475,879	\$ —	\$ —	\$ 475,879	\$ 477,909	2.47%	
US\$ Fixed Rate	—	—	—	—	375,000	—	375,000	383,974	5.63%	
Total	\$ —	\$ —	\$ —	\$ 475,879	\$ 375,000	\$ —	\$ 850,879	\$ 861,883		

(1) Interest rate swap effectively fixed \$400,000 of variable rate debt.

Interest Rate Swap Contracts

As of December 28, 2020, the fair value of the interest rate swap was recorded as a liability in the amount of \$15.0 million. The table below presents information regarding our interest rate swaps for the year ended December 28, 2020:

	For the Year Ended December 28, 2020
	(In thousands, except interest rates)
Average interest payout rate	2.84%
Interest payout amount	\$ (11,482)
Average interest received rate	0.63%
Interest received amount	2,540

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Reference is made to our consolidated financial statements, the notes thereto, and the report thereon, commencing on page 51 of this report, which consolidated financial statements, notes and report are incorporated herein by reference.

We operate on a 52 or 53 week year ending on the Monday nearest December 31. Fiscal years 2020 and 2019 were 52 weeks and ended December 28, 2020 and December 30, 2019, respectively, and each quarter of both fiscal years 2020 and 2019 contained 91 days.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
(In thousands, except per share data)				
Year Ended December 28, 2020(1):				
Net sales	\$ 497,646	\$ 570,298	\$ 513,576	\$ 523,802
Gross profit	81,342	100,430	89,278	87,973
(Loss) income from continuing operations before income taxes	(1,097)	4,879	(62,772)	12,713
Net (loss) income from continuing operations	(3,220)	9,346	(61,472)	38,960
Net (loss) income	(1,174)	181,200	(41,451)	38,960
(Loss) earnings per share for continuing operations:				
Basic	\$ (0.03)	\$ 0.09	\$ (0.58)	\$ 0.36
Diluted	\$ (0.03)	\$ 0.09	\$ (0.58)	\$ 0.34
(Loss) earnings per share:				
Basic	\$ (0.01)	\$ 1.71	\$ (0.39)	\$ 0.36
Diluted	\$ (0.01)	\$ 1.69	\$ (0.39)	\$ 0.34
Year Ended December 30, 2019(2):				
Net sales	\$ 536,445	\$ 526,877	\$ 534,173	\$ 535,715
Gross profit	98,826	92,848	85,258	100,245
Income from continuing operations before income taxes	8,624	11,446	6,583	7,673
Net income from continuing operations	6,238	12,493	2,393	10,797
Net (loss) income	(3,252)	3,424	15,870	25,259
Earnings per share for continuing operations:				
Basic	\$ 0.06	\$ 0.12	\$ 0.02	\$ 0.10
Diluted	\$ 0.06	\$ 0.12	\$ 0.02	\$ 0.10
(Loss) earnings per share:				
Basic	\$ (0.03)	\$ 0.03	\$ 0.15	\$ 0.24
Diluted	\$ (0.03)	\$ 0.03	\$ 0.15	\$ 0.24

(1) Includes restructuring charges of \$0.3 million, \$13.4 million, \$1.1 million, and \$1.9 million in the first quarter, second quarter, third quarter, and fourth quarter, respectively. In addition, a goodwill impairment charge of \$69.2 million is included in the third quarter.

(2) Includes restructuring charges of \$0.4 million, \$2.7 million, and \$2.2 million in the first quarter, second quarter, and fourth quarter, respectively.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES**Evaluation of Disclosure Controls and Procedures**

Our management, under the supervision and with the participation of our Chief Executive Officer (CEO) and Chief Financial Officer (CFO), has evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) as of the end of the period covered by this Report. Based on this evaluation, our CEO and CFO have concluded that, as of December 28, 2020, such disclosure controls and procedures were effective to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is (i) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (ii) accumulated and communicated to our management, including our CEO and CFO, as appropriate to allow timely decisions regarding required disclosures.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP). Under the supervision of and with the participation of our CEO and CFO, management conducted an assessment of the effectiveness of our internal control over financial reporting as of December 28, 2020 based on the criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 28, 2020.

The effectiveness of our internal control over financial reporting as of December 28, 2020 has been audited by KPMG LLP, an independent registered public accounting firm, as stated in their report, which appears under the heading "Report of Independent Registered Public Accounting Firm" on page 52 of this Report.

Inherent Limitations on Effectiveness of Controls

A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. The design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Further, because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been detected. In addition, the design of any system of controls is based in part on certain assumptions about the likelihood of future events.

Changes in Internal Control over Financial Reporting

We continue to expand our implementation of an enterprise resource planning (ERP) system on a worldwide basis, which is expected to improve the efficiency of the financial reporting and related transaction processes. We continue to roll out the ERP system to our remaining locations.

There have been no other changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the quarter ended December 28, 2020 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Not applicable.

PART III

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE*

The information required by this Item is incorporated herein by reference to the definitive Proxy Statement to be filed pursuant to Regulation 14A of the Exchange Act for our 2021 Annual Meeting of Stockholders.

ITEM 11. *EXECUTIVE COMPENSATION*

The information required by this Item is incorporated herein by reference to the definitive Proxy Statement to be filed pursuant to Regulation 14A of the Exchange Act for our 2021 Annual Meeting of Stockholders.

ITEM 12. *SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS*

The information required by this Item is incorporated herein by reference to the definitive Proxy Statement to be filed pursuant to Regulation 14A of the Exchange Act for our 2021 Annual Meeting of Stockholders.

ITEM 13. *CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE*

The information required by this Item is incorporated herein by reference to the definitive Proxy Statement to be filed pursuant to Regulation 14A of the Exchange Act for our 2021 Annual Meeting of Stockholders.

ITEM 14. *PRINCIPAL ACCOUNTING FEES AND SERVICES*

The information required by this Item is incorporated herein by reference to the definitive Proxy Statement to be filed pursuant to Regulation 14A of the Exchange Act for our 2021 Annual Meeting of Stockholders.

PART IV

ITEM 15. **EXHIBITS, FINANCIAL STATEMENT SCHEDULES**

(a) *Financial Statements*

Financial Statements are listed in the Index to Consolidated Financial Statements on page 51 of this Report.

(b) *Exhibits*

Exhibit Number	Exhibits
2.1	<u>Stock Purchase Agreement between TTM Technologies, Inc. and Anaren Holdings, LLC dated December 1, 2017(20)</u>
2.4	<u>Equity Interests Purchase Agreement, dated as of January 20, 2020, by and among TTM Technologies, Inc., TTM Technologies China Limited and AKMMeadville Electronics (Xiamen) Co., Ltd.(9)</u>
3.1(a)	<u>Registrant's Certificate of Incorporation, as amended June 3, 2011(1(a))</u>
3.1(b)	<u>Registrant's Certificate of Amendment of Certificate of Incorporation, dated May 12, 2016(1(b))</u>
3.2	<u>Registrant's Fourth Amended and Restated Bylaws, as amended March 2, 2016(2)</u>
4.1	<u>Indenture, dated as of May 14, 2008, between the Registrant and American Stock Transfer & Trust Company(3)</u>
4.3	<u>Form of Registrant's common stock certificate(4)</u>
4.8	<u>Indenture, dated as of December 20, 2013, between the Registrant and American Stock Transfer & Trust Company, LLC(6)</u>
4.9	<u>Senior Notes Indenture among TTM Technologies, Inc. and Wilmington National Association dated September 28, 2017(19)</u>
4.10*	<u>Description of the Registrant's Securities</u>
10.13‡	<u>TTM Technologies, Inc. 2014 Incentive Compensation Plan(7)</u>
10.15	<u>Form of Director and Officer Indemnification Agreement, dated December 10, 2014(8)</u>
10.20	<u>Special Security Agreement by and among Tang Hsiang Chien, Su Sih (BVI) Limited, the Registrant and the United States Department of Defense, dated October 19, 2010(10)</u>
10.22‡	<u>Executive and Director Deferred Compensation Plan(11)</u>
10.24	<u>Call Option Transaction Confirmation, dated as of December 16, 2013, between the Registrant and JPMorgan Chase Bank, National Association, London Branch(6)</u>
10.25	<u>Warrant Transaction Confirmation, dated as of December 16, 2013, between the Registrant and JPMorgan Chase Bank, National Association, London Branch(6)</u>
10.26	<u>Call Option Transaction Confirmation, dated as of December 16, 2013, between the Registrant and RBC Capital Markets, LLC(6)</u>
10.27	<u>Warrant Transaction Confirmation, dated as of December 16, 2013, between the Registrant and RBC Capital Markets, LLC(6)</u>
10.28	<u>Call Option Transaction Confirmation, dated as of December 16, 2013, between the Registrant and Deutsche Bank AG, London Branch(6)</u>
10.29	<u>Warrant Transaction Confirmation, dated as of December 16, 2013, between the Registrant and Deutsche Bank AG, London Branch(6)</u>
10.30	<u>Call Option Transaction Confirmation, dated as of January 9, 2014, between the Registrant and JPMorgan Chase Bank, National Association, London Branch(12)</u>
10.31	<u>Warrant Transaction Confirmation, dated as of January 9, 2014, between the Registrant and JPMorgan Chase Bank, National Association, London Branch(12)</u>
10.32	<u>Call Option Transaction Confirmation, dated as of January 9, 2014, between the Registrant and RBC Capital Markets, LLC(12)</u>

- 10.33 [Warrant Transaction Confirmation, dated as of January 9, 2014, between the Registrant and RBC Capital Markets, LLC\(12\)](#)
- 10.34 [Call Option Transaction Confirmation, dated as of January 9, 2014, between the Registrant and Deutsche Bank AG, London Branch\(12\)](#)
- 10.35 [Warrant Transaction Confirmation, dated as of January 9, 2014, between the Registrant and Deutsche Bank AG, London Branch\(12\)](#)
- 10.40 [TTM Technologies, Inc. Form of Restricted Stock Unit Award Grant Notice \(for U.S. taxpayers\) pursuant to TTM Technologies, Inc. 2014 Incentive Compensation Plan\(17\)](#)
- 10.41 [TTM Technologies, Inc. Form of Restricted Stock Unit Award Grant Notice \(for non-U.S. taxpayers\) pursuant to TTM Technologies, Inc. 2014 Incentive Compensation Plan\(13\)](#)
- 10.42 [TTM Technologies, Inc. Form of Performance-Based RSU Grant Notice and Award Agreement pursuant to TTM Technologies, Inc. 2014 Incentive Compensation Plan\(17\)](#)
- 10.43 [Form of Executive Change in Control Severance Agreement and schedule of agreements\(13\)](#)
- 10.44 [Facility Agreement, dated May 22, 2015, by and among TTM Technologies Enterprises \(HK\) Limited, The Hongkong and Shanghai Banking Corporation Limited, and the other parties named therein\(14\)](#)
- 10.45 [First Amendment to amend and restate the Term Loan Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, Barclays Bank PLC, as Syndication Agent, and The Royal Bank of Scotland plc and HCBS Securities \(USA\) Inc., as Documentation Agents, dated as of May 31, 2015, as amended September 27, 2016\(18\)](#)
- 10.46 [First Amendment to amend and restate the ABL Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, Barclays Bank PLC, as Syndication Agent, and The Royal Bank of Scotland plc and HCBS Securities \(USA\) Inc., as Documentation Agents, dated as of May 31, 2015, as amended September 27, 2016\(18\)](#)
- 10.47 [TTM Technologies, Inc. Form of Restricted Stock Unit Award Grant Notice \(for non-employee directors\) pursuant to TTM Technologies, Inc. 2014 Incentive Compensation Plan\(15\)](#)
- 10.48 [Amendment to TTM Technologies, Inc. 2014 Incentive Compensation Plan\(16\)](#)
- 10.49 [Second Amendment to the Term Loan Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, Barclays Bank PLC, as Syndication Agent, and The Royal Bank of Scotland plc and HCBS Securities \(USA\) Inc., as Documentation Agents, dated as of May 31, 2015, as first amended September 27, 2016, and as further amended September 28, 2017\(19\)](#)
- 10.50 [Commitment Letter from Barclays Bank PLC dated December 1, 2017\(20\)](#)
- 10.51 [Third Amendment to the Term Loan Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, Barclays Bank PLC, as Syndication Agent, and The Royal Bank of Scotland plc and HCBS Securities \(USA\) Inc., as Documentation Agents, dated as of May 31, 2015, as first amended September 27, 2016, second amended September 28, 2017, and as further amended December 1, 2017\(21\)](#)
- 10.52 [Fourth Amendment to Term Loan Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, Barclays Bank PLC, as Syndication Agent, Deutsche Bank Securities, Inc. and Sun Trust Bank, as Co-Documentation Agents, and Sun Trust Bank, as participant, dated as of April 18, 2018\(22\)](#)
- 10.53 [TTM Technologies, Inc. Executive Compensation Recoupment Policy\(23\)](#)
- 10.54 [Amended and Restated Facility Agreement, dated as of June 4, 2019, by and among TTM Technologies Enterprises \(HK\) Limited, TTM Technologies China Limited and TTM Technologies Trading \(Asia\) Company Limited as borrowers, TTM Technologies \(Asia Pacific\) Limited and other parties as guarantors, The Hongkong and Shanghai Banking Corporation Limited and Barclays Bank PLC as original lenders, The Hongkong and Shanghai Banking Corporation Limited as arranger, facility agent, security trustee and issuing bank\(24\)](#)

10.55	Second Amendment, dated as of June 3, 2019, to the ABL Credit Agreement, by and among TTM Technologies, Inc., as Borrower, the several Lenders from time to time parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, and the other agents thereto(24)
10.56	Chinese Revolver, dated as of July 18, 2019, by and among Shanghai Kaiser Electronics Co., Ltd. and Shanghai Meadville Electronics Co., Ltd., wholly-owned subsidiaries of TTM Technologies, Inc., as borrowers and the Agricultural Bank of China as lender(5)
10.57	Payment Guarantee, dated January 21, 2020, issued by DBS Bank Ltd, Hong Kong Branch on behalf of the Seller(9)
10.58	Payment Guarantee, dated January 21, 2020, issued by Bank of China (Hong Kong) Limited on behalf of the Seller(9)
21.1*	Subsidiaries of the Registrant
23.1*	Consent of KPMG LLP, independent registered public accounting firm
31.1*	CEO Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	CFO Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1*	CEO Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2*	CFO Certification 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 Documents
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Documents
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Documents
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Documents
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)

- (1) Incorporated by reference (a) to the Registrant’s Form 8-K as filed with the Commission on June 6, 2011 and (b) to the Registrant’s Form 8-K as filed with the commission on May 18, 2016.
- (2) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on March 8, 2016.
- (3) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on May 15, 2008.
- (4) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on August 30, 2005.
- (5) Incorporated by reference to the Registrant’s Form 10-Q filed with the Commission on August 7, 2019.
- (6) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on December 20, 2013.
- (7) Incorporated by reference to the Registrant’s Form S-8 as filed with the Commission on August 13, 2014.
- (8) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on December 15, 2014.
- (9) Incorporated by reference to the Registrant’s Form 8-K filed with the Commission on January 22, 2020.
- (10) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on October 22, 2010.
- (11) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on September 19, 2011.
- (12) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on January 14, 2014.
- (13) Incorporated by reference to the Registrant’s Form 10-Q as filed with the Commission on May 5, 2015.
- (14) Incorporated by reference to the Registrant’s Form 8-K as filed with the Commission on May 29, 2015.
- (15) Incorporated by reference to the Registrant’s Form 10-Q as filed with the Commission on August 10, 2015.
- (16) Incorporated by reference to the Registrant’s Form S-8 as filed with the Commission on June 1, 2016.
- (17) Incorporated by reference to the Registrant’s Form 10-Q as filed with the Commission on August 4, 2016.
- (18) Incorporated by reference to the Registrant’s Form 10-Q as filed with the Commission on November 3, 2016.
- (19) Incorporated by reference to the Registrant’s Form 8-K filed with the Commission on September 29, 2017.

- (20) Incorporated by reference to the Registrant's Form 8-K filed with the Commission on December 4, 2017.
- (21) Incorporated by reference to the Registrant's Form 8-K filed with the Commission on December 14, 2017.
- (22) Incorporated by reference to the Registrant's Form 8-K filed with the Commission on April 18, 2018.
- (23) Incorporated by reference to the Registrant's Form 10-K filed with the Commission on February 26, 2019.
- (24) Incorporated by reference to the Registrant's Form 8-K filed with the Commission on June 6, 2019.

‡ Management contract or Compensation Plan

* Filed herewith

(c) *Financial Statement Schedules*

None.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

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

TTM TECHNOLOGIES, INC.

By: /s/ Thomas T. Edman
 Thomas T. Edman
 President and Chief Executive Officer

Date: February 22, 2021

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

Name	Title	Date
<u> /s/ Thomas T. Edman </u> Thomas T. Edman	President, Chief Executive Officer and Director (Principal Executive Officer)	February 22, 2021
<u> /s/ Todd B. Schull </u> Todd B. Schull	Executive Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 22, 2021
<u> /s/ Robert E. Klatell </u> Robert E. Klatell	Chairman of the Board	February 22, 2021
<u> /s/ Kenton K. Alder </u> Kenton K. Alder	Director	February 22, 2021
<u> /s/ Julie S. England </u> Julie S. England	Director	February 22, 2021
<u> /s/ Philip G. Franklin </u> Philip G. Franklin	Director	February 22, 2021
<u> /s/ Rex D. Geveden </u> Rex D. Geveden	Director	February 22, 2021
<u> /s/ Chantel E. Lenard </u> Chantel E. Lenard	Director	February 22, 2021
<u> /s/ John G. Mayer </u> John G. Mayer	Director	February 22, 2021
<u> /s/ Dov S. Zakheim </u> Dov S. Zakheim	Director	February 22, 2021

TTM TECHNOLOGIES, INC.
Index to Consolidated Financial Statements

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Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
TTM Technologies, Inc.:

Opinions on the Consolidated Financial Statements and Internal Control Over Financial Reporting

We have audited the accompanying consolidated balance sheets of TTM Technologies, Inc. and subsidiaries (the Company) as of December 28, 2020 and December 30, 2019, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 28, 2020, and the related notes (collectively, the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of December 28, 2020, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 28, 2020 and December 30, 2019, and the results of its operations and its cash flows for each of the years in the three-year period ended December 28, 2020, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 28, 2020 based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company has changed its method of accounting for leases as of January 1, 2019 due to the adoption of the Financial Accounting Standards Board's (FASB) Accounting Standards Codification (ASC) Topic 842, *Leases*.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying *Management's Report on Internal Control over Financial Reporting*. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting 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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

Critical Audit Matters

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

Evaluation of the sufficiency of audit evidence over net sales

As discussed in Note 1 to the consolidated financial statements, the Company recorded approximately \$2,105,322 thousand of net sales in 2020. Net sales are recognized primarily from the sale of printed circuit boards, custom electronic assemblies using customer-supplied engineering and design plans as well as long-term contracts related to the design and manufacture of radio-frequency and microwave components, assemblies and subsystems around the world.

We identified the evaluation of the sufficiency of audit evidence over net sales as a critical audit matter. Evaluating the sufficiency of audit evidence obtained required especially subjective auditor judgment because of the geographical dispersion and decentralized nature of the Company's net sales generating activities. This included determining the Company locations at which procedures were performed. It also included the involvement of IT professionals with specialized skills and knowledge, who assisted in the performance of certain procedures.

The following are the primary procedures we performed to address this critical audit matter. We applied auditor judgment to determine the nature and extent of procedures to be performed over net sales, including determining the locations at which those procedures were to be performed. At each location where procedures were performed, we (1) evaluated the design and tested the operating effectiveness of certain internal controls over the Company's net sales processes, including the Company's controls over the accurate recording of sales amounts, (2) involved IT professionals, who assisted in testing certain IT applications used by the Company in its revenue recognition processes, and (3) tested the recorded net sales by selecting a sample of transactions and comparing the amounts recognized to underlying documentation, including contracts with customers. In addition, we evaluated the sufficiency of audit evidence obtained over net sales by assessing the results of procedures performed.

Assessment of the goodwill impairment charge for the RF & Specialty (RF&S) Components reporting unit

As discussed in Note 5 to the consolidated financial statements, the Company's RF&S Components reportable segment, which includes the RF&S Components reporting unit, had a goodwill balance of \$108,000 thousand as of December 28, 2020. The Company performs goodwill impairment testing on an annual basis and whenever events or changes in circumstances indicate that the carrying value of a reporting unit might exceed its fair value. During the quarter ended September 28, 2020, the Company identified a triggering event related to its RF&S Components reporting unit and recorded a goodwill impairment charge of \$69,200 thousand. The Company used discounted cash flow and market approaches to estimate the fair value of the reporting unit. The Company recorded an impairment charge equal to the amount by which the carrying value of the reporting unit exceeded its fair value.

We identified the assessment of the Company's goodwill impairment charge recorded in 2020 as a critical audit matter. Subjective auditor judgment was required in assessing the forecasted revenue growth rate and the discount rate assumptions used to estimate the fair value of the reporting unit with a discounted cash flow approach. The evaluation of these assumptions was challenging due to the degree of subjectivity and uncertainty related to the forecasted revenue growth rate. Additionally, differences in judgment used to determine these assumptions could have a significant effect on the reporting unit's estimated fair value and the resulting impairment charge.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls over the Company's process to estimate the reporting unit's fair value, including controls related to the determination of the forecasted revenue growth rate and discount rate assumptions for the reporting unit. We evaluated the Company's forecasted revenue growth rate assumptions by (1) inspecting its written plans or other relevant documentation, such as budgets and minutes, (2) assessing its past history of carrying out its stated intentions, (3) assessing its financial resources and other means to carry out particular actions, (4) assessing regulatory restrictions that could affect its ability to carry out particular actions, and (5) comparing the forecasted revenue to actual revenue recorded subsequent to the measurement date. In addition, we involved valuation professionals with specialized skills and knowledge, who assisted in evaluating the Company's discount rate by evaluating assumptions used to determine the discount rate and by performing benchmarking analyses using publicly available data from peer companies.

/s/ KPMG LLP

We have served as the Company's auditor since 2014.

Irvine, California
February 22, 2021

TTM TECHNOLOGIES, INC.

Consolidated Balance Sheets

	As of	
	December 28, 2020	December 30, 2019
	(In thousands, except par value)	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 451,565	\$ 379,818
Accounts receivable, net	381,105	503,598
Contract assets	273,256	254,600
Inventories	115,651	113,753
Current assets held for sale	—	67,572
Prepaid expenses and other current assets	27,181	23,343
Total current assets	<u>1,248,758</u>	<u>1,342,684</u>
Property, plant and equipment, net	650,435	678,201
Operating lease right-of-use assets	24,340	22,173
Goodwill	637,324	706,524
Definite-lived intangibles, net	281,307	325,680
Non-current assets held for sale	—	425,597
Deposits and other non-current assets	53,780	60,074
Total assets	<u>\$ 2,895,944</u>	<u>\$ 3,560,933</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Short-term debt, including current portion of long-term debt	\$ —	\$ 249,975
Accounts payable	327,102	329,866
Contract liabilities	4,254	3,838
Accrued salaries, wages and benefits	97,268	85,114
Current liabilities held for sale	—	185,391
Other current liabilities	89,422	92,482
Total current liabilities	<u>518,046</u>	<u>946,666</u>
Long-term debt, net of discount and issuance costs	842,853	1,225,962
Operating lease liabilities	17,211	15,413
Non-current liabilities held for sale	—	1,530
Other long-term liabilities	73,825	92,325
Total long-term liabilities	<u>933,889</u>	<u>1,335,230</u>
Commitments and contingencies (Note 13)		
Equity:		
Common stock, \$0.001 par value; 300,000 shares authorized, 106,770 and 105,510 shares issued and outstanding as of December 28, 2020 and December 30, 2019, respectively	107	106
Additional paid-in capital	830,971	814,708
Retained earnings	651,844	474,309
Accumulated other comprehensive loss	(38,913)	(10,086)
Total stockholders' equity	<u>1,444,009</u>	<u>1,279,037</u>
Total liabilities and stockholders' equity	<u>\$ 2,895,944</u>	<u>\$ 3,560,933</u>

See accompanying notes to consolidated financial statements.

TTM TECHNOLOGIES, INC.

Consolidated Statements of Operations

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands, except per share data)		
Net sales	\$ 2,105,322	\$ 2,133,210	\$ 2,237,742
Cost of goods sold	1,746,299	1,756,033	1,835,073
Gross profit	359,023	377,177	402,669
Operating expenses:			
Selling and marketing	63,882	69,171	70,082
General and administrative	122,477	129,284	138,256
Research and development	19,770	17,937	13,717
Amortization of definite-lived intangibles	38,838	45,776	56,983
Restructuring charges	16,764	5,380	4,660
Impairment of goodwill	69,200	—	—
Total operating expenses	330,931	267,548	283,698
Operating income	28,092	109,629	118,971
Other (expense) income:			
Interest expense	(73,156)	(82,087)	(75,764)
Other, net	(1,213)	6,784	3,978
Total other expense, net	(74,369)	(75,303)	(71,786)
(Loss) income from continuing operations before income taxes	(46,277)	34,326	47,185
Income tax benefit (provision)	29,891	(2,405)	88,207
Net (loss) income from continuing operations	(16,386)	31,921	135,392
Income from discontinued operations, net of income taxes	193,921	9,380	38,192
Net income	\$ 177,535	\$ 41,301	\$ 173,584
Earnings per share:			
Basic (loss) earnings per share from continuing operations	\$ (0.15)	\$ 0.30	\$ 1.31
Basic earnings per share from discontinued operations	1.82	0.09	0.37
Basic earnings per share	\$ 1.67	\$ 0.39	\$ 1.68
Diluted (loss) earnings per share from continuing operations	\$ (0.15)	\$ 0.30	\$ 1.10
Diluted earnings per share from discontinued operations	1.82	0.09	0.28
Diluted earnings per share	\$ 1.67	\$ 0.39	\$ 1.38

See accompanying notes to consolidated financial statements.

TTM TECHNOLOGIES, INC.

Consolidated Statements of Comprehensive Income

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Net income	\$ 177,535	\$ 41,301	\$ 173,584
Other comprehensive (loss) income, net of tax:			
Pension obligation adjustments, net	(1,271)	(300)	(1,284)
Reclassification adjustment for foreign currency translation	(346)	—	—
Derecognition of foreign currency translation adjustments due to sale of Mobility business unit	(27,341)	—	—
Foreign currency translation adjustments, net	1,745	(463)	(2,567)
Derecognition of unrealized losses on cash flow hedge due to sale of Mobility business unit	384	—	—
Net unrealized losses on cash flow hedges:			
Unrealized loss on effective cash flow hedges during the year, net	(8,718)	(7,296)	(4,846)
Loss realized in the statement of operations, net	6,720	1,893	1,374
Net	(1,998)	(5,403)	(3,472)
Other comprehensive loss, net of tax	(28,827)	(6,166)	(7,323)
Comprehensive income, net of tax	<u>\$ 148,708</u>	<u>\$ 35,135</u>	<u>\$ 166,261</u>

See accompanying notes to consolidated financial statements.

TTM TECHNOLOGIES, INC.

Consolidated Statements of Stockholders' Equity

	Common Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Total Stockholders' Equity
	Shares	Amount				
	(In thousands)					
<i>Balance, January 1, 2018</i>	101,820	\$ 102	\$ 777,025	\$ 230,850	\$ 3,403	\$ 1,011,380
New revenue standard adjustment	—	—	—	28,574	—	28,574
Net income	—	—	—	173,584	—	173,584
Other comprehensive loss	—	—	—	—	(7,323)	(7,323)
Exercise of stock options	20	—	191	—	—	191
Issuance of common stock for performance-based restricted stock units	521	1	(1)	—	—	—
Issuance of common stock for restricted stock units	1,326	1	(1)	—	—	—
Stock-based compensation	—	—	20,681	—	—	20,681
<i>Balance, December 31, 2018</i>	103,687	\$ 104	\$ 797,895	\$ 433,008	\$ (3,920)	\$ 1,227,087
Net income	—	—	—	41,301	—	41,301
Other comprehensive loss	—	—	—	—	(6,166)	(6,166)
Redemption of convertible notes, net	—	—	(1)	—	—	(1)
Issuance of common stock for performance-based restricted stock units	693	1	(1)	—	—	—
Issuance of common stock for restricted stock units	1,130	1	(1)	—	—	—
Stock-based compensation	—	—	16,816	—	—	16,816
<i>Balance, December 30, 2019</i>	105,510	\$ 106	\$ 814,708	\$ 474,309	\$ (10,086)	\$ 1,279,037
Net income	—	—	—	177,535	—	177,535
Other comprehensive loss	—	—	—	—	(28,827)	(28,827)
Exercise of stock options	20	—	191	—	—	191
Issuance of common stock for performance-based restricted stock units	187	—	—	—	—	—
Issuance of common stock for restricted stock units	1,053	1	(1)	—	—	—
Stock-based compensation	—	—	16,073	—	—	16,073
<i>Balance, December 28, 2020</i>	106,770	\$ 107	\$ 830,971	\$ 651,844	\$ (38,913)	\$ 1,444,009

See accompanying notes to consolidated financial statements.

TTM TECHNOLOGIES, INC.

Consolidated Statements of Cash Flows

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Cash flows from operating activities:			
Net income	\$ 177,535	\$ 41,301	\$ 173,584
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation of property, plant and equipment	120,947	166,574	162,708
Amortization of definite-lived intangible assets	45,182	53,296	63,026
Amortization of debt discount and issuance costs	17,451	14,265	14,687
Deferred income taxes	6,653	(12,454)	(98,291)
Stock-based compensation	16,073	16,816	20,681
Impairment of goodwill	69,200	—	—
Gain on sale of the Mobility business unit	(237,253)	—	—
Other	1,968	(2,142)	(3,789)
Changes in operating assets and liabilities, net of acquisition:			
Accounts receivable, net	122,547	19,501	1,366
Contract assets	(25,093)	(494)	(3,502)
Inventories	1,380	(12,642)	18,254
Prepaid expenses and other current assets	(3,452)	1,802	5,199
Accounts payable	1,210	42,045	(45,739)
Contract liabilities	416	618	(4,558)
Accrued salaries, wages and benefits	7,940	3,770	(14,862)
Other current liabilities	(35,528)	(20,319)	(15,626)
Net cash provided by operating activities	287,176	311,937	273,138
Cash flows from investing activities:			
Acquisition of Anaren, net of cash acquired	—	—	(596,396)
Proceeds from sale of the Mobility business unit, net of cash disposed	507,466	—	—
Purchase of property, plant and equipment and other assets	(103,289)	(142,576)	(150,127)
Proceeds from sale of property, plant and equipment and other assets	738	6,604	331
Other	(623)	—	—
Net cash provided by (used in) investing activities	404,292	(135,972)	(746,192)
Cash flows from financing activities:			
Proceeds from long-term debt borrowings	—	—	600,000
Repayment of debt borrowings	(649,975)	(30,000)	(114,378)
Repayment of assumed long-term debt in acquisition	—	—	(178,604)
Proceeds from borrowings of revolving loan	—	—	23,000
Payment of debt issuance costs	—	(1,803)	(7,653)
Payment of original issue discount	—	—	(1,500)
Proceeds from exercise of stock options	191	—	191
Redemption of convertible notes	—	(10)	—
Other	7,478	—	—
Net cash (used in) provided by financing activities	(642,306)	(31,813)	321,056
Effect of foreign currency exchange rates on cash and cash equivalents	2,249	(358)	(968)
Net increase (decrease) in cash and cash equivalents	51,411	143,794	(152,966)
Cash and cash equivalents at beginning of year	400,154	256,360	409,326
Cash and cash equivalents at end of year	451,565	400,154	256,360
Cash and cash equivalents in assets held for sale	—	(20,336)	(28,368)
Cash and cash equivalents as presented on the consolidated balance sheet	\$ 451,565	\$ 379,818	\$ 227,992
Supplemental cash flow information:			
Cash paid, net for interest	\$ 59,209	\$ 71,267	\$ 62,967
Cash paid, net for income taxes	18,081	20,120	27,574
Net cash provided by operating activities from discontinued operations	39,462	16,123	78,809
Net cash provided by (used in) investing activities from discontinued operations	497,916	(24,155)	(69,906)
Net cash used in financing activities from discontinued operations	—	—	—
Supplemental disclosure of noncash investing activities:			
Property, plant and equipment recorded in accounts payable	\$ 29,002	\$ 58,606	\$ 49,169
Supplemental disclosure of noncash investing activities from discontinued operations:			
Property, plant and equipment recorded in accounts payable	\$ —	\$ 8,918	\$ 9,363

See accompanying notes to consolidated financial statements.

TTM TECHNOLOGIES, INC.
Notes to Consolidated Financial Statements
(Dollars and shares in thousands, except per share data)

(1) Nature of Operations and Summary of Significant Accounting Policies

Nature of Operations

TTM Technologies, Inc. (the Company or TTM) is a leading global printed circuit board (PCB) manufacturer, focusing on quick-turn and volume production of technologically advanced PCBs and backplane assemblies as well as a global designer and manufacturer of high-frequency radio frequency (RF) and microwave components and assemblies. The Company provides time-to-market and volume production of advanced technology products and offers a one-stop design, engineering and manufacturing solution to customers. This one-stop design, engineering and manufacturing solution allows the Company to align technology developments with the diverse needs of the Company's customers and to enable them to reduce the time required to develop new products and bring them to market.

The Company serves a diversified customer base in various markets throughout the world, including aerospace and defense, computing, automotive components, medical, industrial and instrumentation related products, as well as networking/communications infrastructure products. The Company's customers include both original equipment manufacturers (OEMs) and electronic manufacturing services (EMS) providers.

On January 19, 2020, the Company entered into a definitive equity interests purchase agreement with AKMMeadville Electronics (Xiamen) Co., Ltd (the Purchaser) for the sale of the Company's following subsidiaries, which was completed on April 17, 2020: Shanghai Kaiser Electronics Co., Ltd. (SKE), Shanghai Meadville Electronics Co., Ltd. (SME), Shanghai Meadville Science & Technology Co., Ltd. (SP) and Guangzhou Meadville Electronics Co., Ltd. (GME) (collectively, the Mobility business unit). Prior to the closing of the sale of the Company's Mobility business unit, all assets and liabilities attributable to the Mobility business unit have been aggregated under the captions "Current assets held for sale", "Non-current assets held for sale", "Current liabilities held for sale" and "Non-current liabilities held for sale". For all periods presented in the consolidated statements of operations, all sales, costs, expenses, income taxes and gain on sale attributable to the Mobility business unit have been aggregated under the caption "Income (loss) from discontinued operations, net of income taxes". Prior year results have been recast to conform with the current presentation. See Note 3, *Discontinued Operations*, for additional information.

The Company operates on a 52 or 53 week year ending on the Monday nearest December 31. Fiscal 2020, 2019 and 2018 were 52 weeks ended on December 28, 2020, December 30, 2019 and December 31, 2018, respectively. All references to years relate to fiscal years unless otherwise noted.

Reclassifications

During the year ended December 28, 2020, the Company's RF and Specialty Components (RF&S Components) operating segment met the quantitative threshold for separate presentation of a reportable segment. In prior periods, the Company had two reportable segments: PCB and E-M Solutions. The RF&S Components reportable segment was previously aggregated with the PCB reportable segment. As a result, certain prior period amounts have been reclassified to conform with this new presentation.

Further, in 2020, the Company began presenting research and development expenses as a separate line item on the consolidated statements of operations to better align with similar presentation made by peers and to provide additional disclosure that is meaningful for investors. The prior year consolidated statements of operations were adjusted to conform with this new presentation. Research and development expense were previously presented within general and administrative expense on the consolidated statements of operations.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Such estimates include the sales return reserve; allowance for doubtful accounts; inventory reserve; product warranty liabilities; legal contingencies; income taxes; pension obligations; and fair values of financial instruments. These estimates and assumptions are based on management's best estimates and judgment. Due to the coronavirus (COVID-19) global pandemic, the global economy and financial markets have been disrupted and there is a significant amount of uncertainty about the length and severity of the consequences caused by the pandemic. The Company has considered information available to it as of the date of issuance of these financial statements and is not aware of any specific events or circumstances that would require an update to its estimates or judgments, or a revision to the carrying value of its assets or liabilities. Management evaluates its estimates and assumptions on an ongoing basis using historical experience and other factors, including the economic environment, which management believes to be reasonable under the circumstances. Management adjusts such estimates and assumptions when facts and circumstances dictate. The actual results we experienced may differ materially and adversely from our estimates. To the extent there are material differences between the estimates and actual results, our future result of operations will be affected.

Principles of Consolidation

The consolidated financial statements include the accounts of TTM and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Foreign Currency Translation and Transactions

The functional currency of certain of the Company's subsidiaries is the Chinese Renminbi (RMB). Accordingly, assets and liabilities are translated into U.S. dollars using period-end exchange rates. Sales and expenses are translated at the average exchange rates in effect during the period. The resulting translation gains or losses are recorded as a component of accumulated other comprehensive (loss) income in the consolidated statement of stockholders' equity and the consolidated statement of comprehensive income. Net losses resulting from foreign currency remeasurements and transactions are included in expenses as a component of other, net in the consolidated statements of operations and totaled \$10,475, \$467 and \$786 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

Cash Equivalents

The Company considers highly liquid investments with insignificant interest rate risk and original maturities to the Company of three months or less to be cash equivalents.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are reflected at estimated net realizable value, do not bear interest and do not generally require collateral. The Company performs credit evaluations of its customers and adjusts credit limits based upon payment history and the customer's current creditworthiness. The Company maintains an allowance for doubtful accounts based upon a variety of factors. The Company considers both current and forecasted future economic conditions in determining the adequacy of its allowance for doubtful accounts.

The Company's allowance for doubtful accounts was \$2,886, \$1,929, and \$2,750 as of December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

Inventories

Inventories are stated at the lower of cost (determined on a first-in, first-out and weighted average basis) or net realizable value. Assessments to value the inventory at the lower of the actual cost to purchase and/or manufacture the inventory, or net realizable value of the inventory, are based upon assumptions about future demand and market conditions. As a result of the Company's assessments, when the net realizable value of inventory is less than the carrying value, the inventory cost is written down to the net realizable value and the write down is recorded as a charge to cost of goods sold.

Property, Plant and Equipment, Net

Property, plant and equipment are recorded at cost. Depreciation expense is computed using the straight-line method over the estimated useful lives of the assets. Assets recorded under leasehold improvements are amortized using the straight-line method over the lesser of their useful lives or the related lease term. The Company uses the following estimated useful lives:

Land use rights	50-99 years
Buildings and improvements	7-50 years
Machinery and equipment	3-10 years
Furniture and fixtures	3-7 years

Upon retirement or other disposition of property, plant and equipment, the cost and related accumulated depreciation are removed from the accounts. The resulting gain or loss is included in the determination of operating income in the period incurred. Depreciation and amortization expense on property, plant and equipment was \$99,572, \$93,370, and \$91,329 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

The Company capitalizes interest on borrowings during the active construction period of major capital projects. Capitalized interest is amortized over the average useful lives of such assets, which primarily consist of buildings and machinery and equipment. The Company capitalized interest costs of \$1,783, \$1,810 and \$1,438 during the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively, in connection with various capital projects.

Major renewals and betterments are capitalized and depreciated over their estimated useful lives while minor expenditures for maintenance and repairs are included in operating income as incurred.

Goodwill

Goodwill represents the excess of purchase price of an acquisition over the fair value of net assets acquired. Goodwill is not amortized but instead is assessed for impairment, at a reporting unit level, annually and when events and circumstances warrant an evaluation. Goodwill is allocated to reporting units, which are operating segments or one level below the Company's operating segments (the component level). Reporting units are determined by the discrete financial information available for the component and whether it is regularly reviewed by segment management. Components are aggregated into a single reporting unit if they share similar economic characteristics. The Company evaluates its goodwill on an annual basis in the fourth quarter or more frequently if it believes indicators of impairment exist. The Company 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 or performs an annual impairment test. When tested quantitatively, the Company compares the fair value of the applicable reporting unit with its carrying value. In making this assessment, management relies on a number of factors, including expected future operating results, business plans, economic projections, anticipated future cash flows, business trends and declines in the Company's market capitalization. The Company estimates the fair values of its reporting units using a combination of the discounted cash flow (DCF) and market approaches. If the carrying amount of a reporting unit exceeds the reporting unit's fair value, the amount by which the carrying value exceeds the fair value is recognized as an impairment loss. See Note 5 for further details.

During the fourth quarter of 2020, the Company changed the date of its annual impairment test of goodwill from year-end to the first day of fiscal November to provide for additional time to complete the required impairment testing. This change does not represent a material change to the Company's method of applying an accounting principle. The change in annual impairment test date has been prospectively applied beginning the first day of fiscal November 2020.

Intangible Assets

Intangible assets include customer relationships and technology, which are being amortized over their estimated useful lives on a straight-line basis. The estimated useful lives of such intangibles range from 5 years to 13 years.

Impairment of Long-lived Assets

Long-lived tangible assets, including property, plant and equipment, assets held for sale, and definite-lived intangible assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying value of the asset or asset groups may not be recoverable. The Company regularly evaluates whether events or circumstances have occurred that indicate possible impairment and relies on a number of factors, including expected future operating results, business plans, economic projections, and anticipated future cash flows. The Company uses an estimate of the future undiscounted net cash flows of the related asset or asset group over the remaining life in measuring whether the assets are recoverable. If the sum of the undiscounted cash flows is less than the carrying amount of the net assets, impairment is measured based on the difference between the net asset's carrying value and estimated fair value. Fair value is determined through various valuation techniques, including cost-based, market and income approaches as considered necessary.

The Company classifies assets to be sold as assets held for sale when (i) Company management has approved and commits to a plan to sell the asset; (ii) the asset is available for immediate sale in its present condition and is ready for sale; (iii) an active program to locate a buyer and other actions required to sell the asset have been initiated; (iv) the sale of the asset is probable; (v) the asset is being actively marketed for sale at a price that is reasonable in relation to its current fair value; and (vi) it is unlikely that significant changes to the plan will be made or that the plan will be withdrawn. Assets classified as held for sale are recorded at the lower of the carrying amount or fair value less the cost to sell.

The Company classifies assets held for use when a decision to dispose of an asset or a business is made and the held for sale criteria are not met. In evaluating the recoverability of property and intangible assets subject to amortization, in a held for use business, the carrying value is first compared to the sum of the undiscounted cash flows expected to result from the use and eventual disposition. If the carrying value exceeds the undiscounted expected cash flows, then a fair value analysis is performed. An impairment charge is recognized if the carrying value exceeds the fair value.

Leases

The Company adopted the new lease standard as of January 1, 2019 under the retrospective cumulative effect adjustment transition method. Therefore, the consolidated financial statements for the year ended December 31, 2018 have not been adjusted and continued to be reported under previous U.S. GAAP guidance. As a result, beginning in the first quarter of 2019, the Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use (ROU) assets, and lease liabilities are included in other current liabilities and operating lease liabilities on the consolidated balance sheets.

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

The Company has lease agreements with lease and non-lease components and accounts for the lease and non-lease components as a single lease component.

Revenue Recognition

The Company derives revenues primarily from the sale of PCBs, custom electronic assemblies using customer-supplied engineering and design plans as well as the design and manufacture of RF and microwave components and assemblies. In the absence of a sales agreement, the Company's standard terms and conditions apply. Revenue is recognized when control of the promised goods or services is transferred to the Company's customers, in an amount that reflects the consideration to which it expects to be entitled in exchange for those goods or services. The Company applies a five-step approach as defined in the new standard in determining the amount and timing of revenue to be recognized: (1) identifying the contract with a customer; (2) identifying the performance obligations in the contract; (3) determining the transaction price; (4) allocating the transaction price to the performance obligations in the contract; and (5) recognizing revenue when the corresponding performance obligation is satisfied.

Revenue Streams

For PCBs and custom electronic assemblies, including pursuant to the Company's long-term contracts related to the manufacture of components, assemblies and subsystems, orders for products generally correspond to the production schedules of the Company's customers and are supported with firm purchase orders. The Company's customers have continuous control of the work in progress and finished goods throughout the PCB and custom electronic assemblies manufacturing process, as these are built to customer specifications with no alternative use, and there is an enforceable right to payment for work performed to date. As a result, the Company recognizes revenue progressively over time based on the extent of progress towards completion of the performance obligation. Revenue recognized is based on a cost method as it best depicts the transfer of control to the customer which takes place as we incur costs. Revenues are recorded proportionally as costs are incurred.

In addition, the Company manufactures components, assemblies, and subsystems which service its RF&S Components customers. The Company recognizes revenue at a point in time upon transfer of control of the products to the customer. Point in time recognition was determined as the customer does not simultaneously receive or consume the benefits provided by the Company's performance and the asset being manufactured has alternative uses to the Company.

Performance Obligations

Each distinct promise to transfer products is considered to be an identified performance obligation for which revenue is recognized upon transfer of control of the products to the customer. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The majority of the Company's contracts have a single performance obligation as the promise to transfer the individual good or service is not separately identifiable from other promises in the contract and is, therefore, not distinct. As of December 28, 2020, the aggregate amount of the transaction price allocated to remaining performance obligations for the Company's long-term contracts was \$21,275. The Company expects to recognize revenue on approximately 99% of the remaining performance obligations for the Company's long-term contracts over the next twelve months with the remaining amount recognized thereafter. The remaining performance obligations for the Company's short-term contracts are expected to be recognized within one year.

Notes to Consolidated Financial Statements — (Continued)

Transaction Price

The Company provides customers a limited right of return for defective PCBs including components, subsystems and assemblies. Estimates of returns are treated as variable consideration for purposes of determining the transaction price. The Company accrues an estimate for sales returns and allowances progressively over time based on the extent of progress towards completion of the performance obligation using the Company's judgment based on historical results and anticipated returns. To the extent actual experience varies from its historical experience, revisions to the sales returns and allowances accrual may be required. Sales returns and allowances are recorded as a reduction of revenue and included as a component of accrued expenses on the consolidated balance sheets. Shipping and handling fees and related freight costs and supplies associated with shipping products to customers are included as a component of cost of goods sold. Warranty-related services are not considered a separate performance obligation. Incremental warranty costs that are not related to sales returns are recorded in accrued expenses on the consolidated balance sheets and cost of goods sold on the consolidated statements of operations. The following summarizes the activity in the Company's sales returns and allowances for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Balance at beginning of year	\$ 12,717	\$ 15,296	\$ 8,171
Addition charged as a reduction of sales	7,658	15,632	22,750
Deductions	(7,389)	(18,228)	(15,602)
Effect of foreign currency exchange rates	29	17	(23)
Balance at end of year	<u>\$ 13,015</u>	<u>\$ 12,717</u>	<u>\$ 15,296</u>

Contract Balances

Accounts receivable represents the Company's unconditional right to receive consideration from its customer. Payments are generally due within 90 days or less of invoicing and do not include a significant financing component. To date, there have been no material impairment losses on accounts receivable.

A contract asset is recognized when the Company has recognized revenue, but not issued an invoice for payment. Contract assets are classified as current assets and are transferred to receivables when the entitlement to payment becomes unconditional. The Company's contract assets are generally converted to trade account receivables within 90 days, at which time the Company is entitled to payment of the fixed price upon delivery of the finished product subject to customer payment terms. Contract assets were \$273,256 and \$254,600 as of December 28, 2020 and December 30, 2019, respectively, and represent unbilled amounts for work performed to date. In 2020, there were no material impairment losses on contract assets.

A contract liability is recognized when the Company has received payment in advance for the future transfer of goods or services. The Company's contract liabilities are generally converted to revenue within 90 days. Contract liabilities were \$4,254 and \$3,838 as of December 28, 2020 and December 30, 2019, respectively, and represent customer advances for work yet to be performed.

The Company has elected to account for shipping and handling activities as a fulfillment cost as permitted by the standard. All incremental customer contract acquisition costs are expensed as they are incurred as the amortization period of the asset that the Company otherwise would have recognized is one year or less in duration.

Notes to Consolidated Financial Statements — (Continued)

Disaggregated Revenue

Revenue from products and services transferred to customers over time and at a point in time accounted for 98% and 2%, respectively, of the Company's revenue in 2020, 2019 and 2018.

The following tables represent a disaggregation of revenue by principal end markets with the reportable segments:

End Markets	For the Year Ended December 28, 2020			
	PCB	RF&S Components	E-M Solutions	Total
	(In thousands)			
Aerospace and Defense	\$ 745,041	\$ 189	\$ 655	\$ 745,885
Automotive	270,240	—	48,615	318,855
Cellular Phone	1,341	—	—	1,341
Computing/Storage/Peripherals	258,032	834	170	259,036
Medical/Industrial/Instrumentation	374,237	2,967	10,491	387,695
Networking/Communications	234,211	39,160	97,213	370,584
Other	22,141	1,506	(1,721)	21,926
Total	\$ 1,905,243	\$ 44,656	\$ 155,423	\$ 2,105,322

End Markets	For the Year Ended December 30, 2019			
	PCB	RF&S Components	E-M Solutions	Total
	(In thousands)			
Aerospace and Defense	\$ 696,279	\$ 777	\$ 543	\$ 697,599
Automotive	302,101	—	102,004	404,105
Cellular Phone	1,224	—	—	1,224
Computing/Storage/Peripherals	235,615	1,588	288	237,491
Medical/Industrial/Instrumentation	331,551	3,752	29,682	364,985
Networking/Communications	253,306	43,333	94,435	391,074
Other	24,486	12,865	(619)	36,732
Total	\$ 1,844,562	\$ 62,315	\$ 226,333	\$ 2,133,210

End Markets	For the Year Ended December 31, 2018			
	PCB	RF&S Components	E-M Solutions	Total
	(In thousands)			
Aerospace and Defense	\$ 606,573	\$ 153	\$ 858	\$ 607,584
Automotive	388,643	—	86,828	475,471
Computing/Storage/Peripherals	280,497	939	1,694	283,130
Medical/Industrial/Instrumentation	345,078	2,271	39,852	387,201
Networking/Communications	322,128	40,982	96,894	460,004
Other	16,171	8,360	(179)	24,352
Total	\$ 1,959,090	\$ 52,705	\$ 225,947	\$ 2,237,742

Value Added and Sales Tax Collected from Customers

As a part of the Company's normal course of business, value added and sales taxes are collected from customers. Such taxes collected are remitted, in a timely manner, to the appropriate governmental tax authority on behalf of the customer. Value added and sales taxes are excluded from reported revenues and costs of goods sold presented in the consolidated statements of operations and comprehensive income.

Stock-Based Compensation

The Company recognizes stock-based compensation expense in its consolidated financial statements for its incentive compensation plan awards. The incentive compensation plan awards include performance-based restricted stock units, restricted stock units, and stock options. The associated compensation expense for all awards is based on the grant date fair value of the awards. For performance-based restricted stock units, compensation expense also includes management's periodic assessment of annual financial performance goals to be achieved. Compensation expense for the incentive compensation plan awards is recognized on a straight line

basis over the vesting period of the awards. The fair value of performance-based restricted stock units is estimated on the grant date using a Monte Carlo simulation model based on the underlying common stock closing price as of the date of grant, stock price volatility, and risk-free interest rates. The fair value of restricted stock units is measured on the grant date based on the quoted closing market price of the Company's common stock. The fair value of the stock options is estimated on the grant date using the Black-Scholes option pricing model based on the underlying common stock closing price as of the date of grant, the expected term, stock price volatility, and risk-free interest rates.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred income tax assets or liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred income tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be settled or realized. The effect on deferred income tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. Deferred income tax assets are reviewed for recoverability, and the Company records a valuation allowance to reduce its deferred income tax assets when it is more likely than not that all or some portion of the deferred income tax assets will not be realized.

The Company has various foreign subsidiaries formed or acquired to conduct or support its business outside the United States. The Company expects its earnings attributable to foreign subsidiaries will be indefinitely reinvested except for our material Chinese and Canadian plants and the respective holding companies where a deferred tax liability has been recorded for foreign withholding and estimated federal/state tax impact. For those other companies with earnings currently being reinvested outside of the U.S., no deferred tax liabilities on undistributed earnings are recorded.

The Company recognizes the effect of income tax positions only if those positions are more likely than not to be sustained. Recognized income tax positions are measured at the largest amount that is greater than 50 percent likely to be realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs. Estimated interest and penalties related to underpayment of income taxes are recorded as a component of income tax provision in the consolidated statements of operations.

Fair Value Measures

The Company measures at fair value certain of its financial and non-financial assets and liabilities by using a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, essentially an exit price, based on the highest and best use of the asset or liability. The levels of the fair value hierarchy are:

Level 1 — Quoted market prices in active markets for identical assets or liabilities;

Level 2 — Significant other observable inputs (e.g., quoted prices for similar items in active markets, quoted prices for identical or similar items in markets that are not active, inputs other than quoted prices that are observable, such as interest rate and yield curves, and market-corroborated inputs); and

Level 3 — Unobservable inputs in which there is little or no market data, which require the reporting unit to develop its own assumptions.

Earnings Per Share

Basic earnings per common share excludes dilution and is computed by dividing net income by the weighted average number of common shares outstanding during the period. Diluted earnings per common share reflect the potential dilution that could occur if stock options, Convertible Senior Notes or other common stock equivalents were exercised or converted into common stock. The dilutive effect of stock options or other common stock equivalents is calculated using the treasury stock method. During the year ended December 28, 2020, the Company calculated the dilutive effect of Convertible Senior Notes using the treasury stock method because the Company repaid and settled the Convertible Senior Notes in cash. This change in policy from the if-converted method to treasury stock method was applied on a prospective basis.

Comprehensive Income

Comprehensive income includes changes to equity accounts that were not the result of transactions with stockholders. Comprehensive income is comprised of net income, changes in the cumulative foreign currency translation adjustments, pension obligation adjustments, and realized and unrealized gains or losses on hedged derivative instruments.

Loss Contingencies

The Company establishes an accrual for an estimated loss contingency when it is both probable that an asset has been impaired or that a liability has been incurred and the amount of the loss can be reasonably estimated. Any legal fees expected to be incurred in connection with a contingency are expensed as incurred.

Accounting for Retirement Benefit Plans

The Company accounts for its retirement benefit plans and postretirement and postemployment benefit obligations in accordance with ASC Topic 715, *Compensation—Retirement Benefits*. ASC Topic 715 requires the Company to recognize the overfunded or underfunded status of a defined benefit plan, measured as the difference between the fair value of plan assets and the plan's benefit obligation, as an asset or liability in its consolidated balance sheets and to recognize changes to that funded status in the year in which the changes occur through accumulated other comprehensive loss. ASC Topic 715 also requires measurement of the funded status of a plan as of the Company's consolidated balance sheet dates.

Recently Adopted and Issued Accounting Standards*Recently Adopted Accounting Standards*

In March 2020, the Financial Accounting Standards Board (FASB) issued ASU 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting*, which provides temporary relief to the GAAP guidance on contract modifications and hedge accounting to ease the financial reporting burdens of the expected market transition from LIBOR and other interbank offered rates to alternative rates. This guidance became effective beginning on March 12, 2020 and will remain in effect through December 31, 2022. The guidance on contract modifications can be applied prospectively from any date beginning March 12, 2020 and may also be applied to modifications of existing contracts made earlier in the interim period that included March 12, 2020. The guidance on hedging can be applied to eligible hedging relationships existing at the beginning of the interim period that included March 12, 2020 and to new eligible hedging relationships entered into after the beginning of that interim period. The Company adopted this ASU and it did not have a material impact on its consolidated financial statements.

In August 2018, the FASB issued ASU 2018-14, *Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20)—Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans*. The amendments in this update change the disclosure requirements for employers that sponsor defined benefit pension and/or other postretirement benefit plans. It eliminates requirements for certain disclosures that are no longer considered cost beneficial and requires new disclosures that the FASB considers pertinent. The Company adopted this ASU as of December 28, 2020 and it did not have a material impact on its consolidated financial statements. See Note 15 for disclosure changes made.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which amends the current accounting guidance and requires the measurement of all expected losses based on historical experience, current conditions and reasonable and supportable forecasts. For trade receivables, loans, and other financial instruments, the Company will be required to use a forward-looking expected loss model that reflects losses that are probable rather than the incurred loss model for recognizing credit losses. The standard became effective for interim and annual periods beginning after December 15, 2019. Application of the amendments is through a cumulative-effect adjustment to retained earnings as of the effective date. The Company adopted this ASU as of December 31, 2019 and it did not have a material impact on its consolidated financial statements.

Recently Issued Accounting Standards Not Yet Adopted

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*, which is intended to simplify various aspects related to accounting for income taxes. ASU 2019-12 removes certain exceptions to the general principles in Topic 740 and also clarifies and amends existing guidance to improve consistent application. The guidance is effective for fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Early adoption is permitted. The Company has evaluated the new guidance to determine the impact it may have on its consolidated financial statements and related disclosures and the impact is not expected to be material.

(2) Leases

The Company leases some of its manufacturing and assembly plants, sales offices and equipment under non-cancellable operating leases that expire at various dates through 2049. The majority of the Company's lease arrangements are comprised of fixed payments and certain leases consist of variable payments based on equipment usage. These variable payments are not included in the measurement of the ROU asset or lease liability due to uncertainty of the payment amount and are recorded as lease expense in the period incurred. Certain leases contain renewal provisions at the Company's option. Most of the leases require the Company to pay for certain other costs such as property taxes and maintenance. Certain leases also contain rent escalation clauses (step rents) that require additional rental amounts in the later years of the term. Rent expense for leases with step rents is recognized on a straight-line basis

Notes to Consolidated Financial Statements — (Continued)

over the minimum lease term. The lease agreements do not contain any material residual value guarantees or material restrictive covenants.

The components of lease expense were as follows:

	For the Year Ended	
	December 28, 2020	December 30, 2019
	(In thousands)	
Operating lease cost	\$ 9,304	\$ 8,560
Variable lease cost	529	591
Short-term lease cost	525	520

Supplemental cash flow information related to leases was as follows:

	For the Year Ended	
	December 28, 2020	December 30, 2019
	(In thousands)	
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	\$ 8,865	\$ 8,265
Right-of-use assets obtained in exchange for new lease obligations:		
Operating leases	10,036	13,596

Supplemental balance sheet information related to leases was as follows:

	As of	
	December 28, 2020	December 30, 2019
	(In thousands)	
Operating lease right-of-use assets	\$ 24,340	\$ 22,173
Other current liabilities	8,144	7,111
Operating lease liabilities	17,211	15,413
Total operating lease liabilities	\$ 25,355	\$ 22,524

	As of	
	December 28, 2020	December 30, 2019
Weighted average remaining lease term	4.2 years	4.4 years
Weighted average discount rate	3.31%	3.92%

Maturities of operating lease liabilities were as follows (1):

	(In thousands)	
Less than one year	\$	9,170
1 - 2 years		5,240
2 - 3 years		4,562
3 - 4 years		3,586
4 - 5 years		2,313
Thereafter		2,336
Total lease payments		27,207
Less imputed interest		(1,852)
Total	\$	25,355

(1) Excludes \$955 of legally binding minimum lease payments for leases signed but not yet commenced.

TTM TECHNOLOGIES, INC.
Notes to Consolidated Financial Statements — (Continued)

Operating Leases Pre-Topic 842 Adoption

The following is a schedule of future minimum lease payments as of December 31, 2018:

	<u>Operating Leases</u> <u>(In thousands)</u>
2019	\$ 6,204
2020	4,677
2021	3,406
2022	2,408
2023	2,172
Thereafter	4,172
Total minimum lease payments	\$ 23,039

Total rent expense for the year ended December 31, 2018 was approximately \$9,297.

(3) Discontinued Operations

On January 19, 2020, the Company entered into a definitive equity interests purchase agreement for the sale of the Company's Mobility business unit. The sale was completed on April 17, 2020 for a base purchase price of \$550,000, subject to customary purchase price adjustments. The base purchase price does not include certain accounts receivable of the divested business, which were estimated to total approximately \$95,000. Subsequently, the final purchase price was \$569,246 after customary purchase price adjustments, which did not include approximately \$83,000 accounts receivable of the divested business.

On April 18, 2020, the Company also entered into a Transition Services Agreement (TSA) with the Purchaser pursuant to which the Purchaser is receiving certain services (the Services) to enable it to operate the Mobility business unit after the closing of the sale of the Mobility business unit. The Services include finance and accounting, human resources, legal and compliance, sales, information technology, and other corporate support services. Under the TSA, the Services are being provided at cost for a period of up to 24 months. In addition, the Company entered into a Manufacturing Supply Agreement with the Purchaser pursuant to which the Purchaser will supply products to a few customers of the Company. There was no material impact on the Company's consolidated financial statements.

Further, on June 29, 2020, the Company entered into a Sales Force Agreement with the Purchaser pursuant to which the Company's sales representatives will assist the Purchaser in selling PCBs manufactured by the Purchaser to certain customers for a commission for a period up to April 17, 2021. There was no material impact on the Company's consolidated financial statements.

As the sale of the Company's Mobility business unit represents a strategic shift that will have a major effect on the Company's operations and financial results, in accordance with the provisions of FASB authoritative guidance on the presentation of financial statements, Mobility business unit results are classified as discontinued operations in the consolidated statements of operations for all periods presented. Prior year results have been recast to conform with the current presentation.

Notes to Consolidated Financial Statements — (Continued)

The following table summarizes the results of Mobility operations for each period prior to sale:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands, except per share data)		
Net sales	\$ 143,951	\$ 556,098	\$ 609,519
Cost of goods sold	136,800	531,592	555,154
Gross profit	7,151	24,506	54,365
Operating expenses:			
Selling and marketing	1,461	4,840	3,231
General and administrative	2,317	4,875	7,464
Research and development	147	—	—
Amortization of definite-lived intangibles	809	2,698	2,698
Restructuring charges	—	1,601	858
Total operating expenses	4,734	14,014	14,251
Operating income	2,417	10,492	40,114
Other (expense) income:			
Interest expense	(223)	(1,147)	(3,194)
Gain on sale of the Mobility business unit	237,253	—	—
Other, net	1,160	2,513	5,663
Total other income, net	238,190	1,366	2,469
Income from discontinued operations before income taxes	240,607	11,858	42,583
Income tax provision	(46,686)	(2,478)	(4,391)
Income from discontinued operations, net of income taxes	\$ 193,921	\$ 9,380	\$ 38,192
Earnings per share from discontinued operations:			
Basic earnings per share	\$ 1.82	\$ 0.09	\$ 0.37
Diluted earnings per share	\$ 1.82	\$ 0.09	\$ 0.28

Depreciation expense related to the discontinued operations for the years ended December 28, 2020, December 30, 2019, and December 31, 2018 was \$21,375, \$73,204, and \$71,379, respectively.

During the year ended December 28, 2020, the Company's income tax expense related to the discontinued operations was impacted by a net discrete tax expense of \$46,686. The net income tax expense for the year ended December 28, 2020 is related mainly to (i) China withholding tax related to gain on sale, (ii) U.S. income tax related to Global Intangible Low Taxed Income (GILTI) inclusion net of IRC Section 250 deduction and foreign tax credits, and offset by (iii) release of U.S. uncertain tax positions as a result of available excess foreign tax credits.

Notes to Consolidated Financial Statements — (Continued)

Assets sold and liabilities being assumed by the Purchaser in the sale of the Company's Mobility business unit include substantially all assets and liabilities, with the exception of certain accounts receivable. The following table summarizes the major categories of assets and liabilities classified as held for sale in the consolidated balance sheet as of December 30, 2019:

	<u>As of</u> <u>December 30, 2019</u> <u>(In thousands)</u>
Cash and cash equivalents	\$ 20,336
Accounts receivable, net	66
Contract assets	33,635
Inventories	8,266
Prepaid expenses and other current assets	5,269
Property, plant and equipment, net	344,728
Operating lease right-of-use assets	1,983
Goodwill	68,267
Definite-lived intangibles, net	6,328
Deposits and other non-current assets	4,291
Total assets classified as held for sale	<u>\$ 493,169</u>
Accounts payable	\$ 153,700
Accrued salaries, wages and benefits	13,606
Other current liabilities	18,085
Operating lease liabilities	1,104
Other long-term liabilities	426
Total liabilities classified as held for sale	<u>\$ 186,921</u>

Notes to Consolidated Financial Statements — (Continued)

Proceeds from the sale of the Company's Mobility business unit have been presented in the consolidated statements of cash flows within net cash provided by investing activities from discontinued operations. The following is a reconciliation of the gain recorded for the sale of the Company's Mobility business unit (*in thousands*):

Net proceeds from the sale of the Mobility business unit (1)	\$	569,246
Mobility business unit assets:		
Cash and cash equivalents		12,513
Restricted cash		35,412
Accounts receivable, net		12
Contract assets		40,072
Inventories		4,988
Prepaid expenses and other current assets		4,593
Property, plant and equipment, net		328,648
Goodwill		68,267
Definite-lived intangibles, net		5,520
Deposits and other non-current assets		6,291
Total Mobility business unit assets		<u>506,316</u>
Mobility business unit liabilities:		
Accounts payable		142,636
Accrued salaries, wages and benefits		9,392
Other current liabilities		8,890
Other long-term liabilities		303
Total Mobility business unit liabilities		<u>161,221</u>
Derecognition of foreign currency translation adjustments and unrealized losses on cash flow hedges recorded in accumulated other comprehensive loss		26,957
Other transaction costs incurred as part of the sale of the Mobility business unit (2)		13,855
Gain on sale of the Mobility business unit before income taxes	\$	<u><u>237,253</u></u>

(1) Net proceeds from the sale of the Mobility business unit are net of the finalized customary purchase price adjustments.

(2) Costs directly incurred as a result of the sale of the Company's Mobility business unit, including bank fees, legal fees, professional fees, and other costs.

TTM TECHNOLOGIES, INC.
Notes to Consolidated Financial Statements — (Continued)

(4) Composition of Certain Consolidated Financial Statement Captions

	As of	
	December 28, 2020	December 30, 2019
(In thousands)		
Inventories:		
Raw materials	\$ 103,890	\$ 97,660
Work-in-process	7,841	10,898
Finished goods	3,920	5,195
	<u>\$ 115,651</u>	<u>\$ 113,753</u>
Property, plant and equipment, net:		
Land and land use rights	\$ 61,781	\$ 62,009
Buildings and improvements	398,540	381,980
Machinery and equipment	832,723	777,916
Furniture and fixtures and other	10,304	10,329
Construction-in-progress	33,191	58,195
	<u>1,336,539</u>	<u>1,290,429</u>
Less: Accumulated depreciation	<u>(686,104)</u>	<u>(612,228)</u>
	<u>\$ 650,435</u>	<u>\$ 678,201</u>
Other current liabilities:		
Sales return and allowances	\$ 13,015	\$ 12,717
Restructuring	7,382	502
Interest	7,157	8,893
Income taxes payable	2,428	13,035
Other	59,440	57,335
	<u>\$ 89,422</u>	<u>\$ 92,482</u>
Other long-term liabilities:		
Deferred income taxes	\$ 23,704	\$ 25,435
Derivative liabilities	14,968	12,067
Defined benefit pension plan liability	9,986	9,313
Other	25,167	45,510
	<u>\$ 73,825</u>	<u>\$ 92,325</u>

(5) Goodwill

As of December 28, 2020, December 30, 2019 and December 31, 2018, goodwill by reportable segment was as follows:

	PCB	RF&S Components	Total
	(In thousands)		
Balance as of December 31, 2018			
Goodwill	\$ 692,978	\$ 177,200	\$ 870,178
Accumulated impairment losses	<u>(171,400)</u>	<u>—</u>	<u>(171,400)</u>
	521,578	177,200	698,778
Goodwill recognized during the year	<u>7,746</u>	<u>—</u>	<u>7,746</u>
Balance as of December 30, 2019			
Goodwill	700,724	177,200	877,924
Accumulated impairment losses	<u>(171,400)</u>	<u>—</u>	<u>(171,400)</u>
	529,324	177,200	706,524
Impairment loss during the year	<u>—</u>	<u>(69,200)</u>	<u>(69,200)</u>
Balance as of December 28, 2020			
Goodwill	700,724	177,200	877,924
Accumulated impairment losses	<u>(171,400)</u>	<u>(69,200)</u>	<u>(240,600)</u>
	<u>\$ 529,324</u>	<u>\$ 108,000</u>	<u>\$ 637,324</u>

Notes to Consolidated Financial Statements — (Continued)

The Company evaluates its goodwill on an annual basis during its fourth fiscal quarter and at other times when events or changes in circumstances — such as significant adverse changes in the business climate or operating results or changes in management strategy, coupled with a decline in the market price of its stock and market capitalization — indicate that there may be a potential impairment. During the third quarter of 2020, the Company determined that there was a permanent loss of sales due to certain government restrictions on the sale of U.S.-designed products to certain customers in China in the RF&S Components reporting unit that coupled with the impact of COVID-19, resulted in lower than anticipated results and continued decline in sales. The Company considered these factors to be indicators of potential impairment requiring the Company to test the related goodwill for impairment. As of September 28, 2020, the Company completed a quantitative goodwill impairment analysis related to its RF&S Components reporting unit by comparing the fair value of the reporting unit with its carrying amount. The Company determined the fair value of the reporting unit by using both a DCF and a market approach. Under the market approach, the Company used revenue and earnings multiples based on comparable industry multiples to estimate the fair value of the reporting unit.

Under the DCF approach, the Company estimated the future cash flows, as well as selected a risk-adjusted discount rate to measure the present value of the anticipated cash flows. When determining future cash flow estimates, the Company considered historical results adjusted to reflect current and anticipated future operating conditions. The Company estimated cash flows for the reporting unit over a discrete period and a terminal period (considering expected long-term growth rates and trends).

Based on its analysis, the Company determined that the fair value of the RF&S Components reporting unit was less than its carrying value and recorded a goodwill impairment charge of \$69,200. Estimating the fair value of the reporting unit requires the Company to make assumptions and estimates in such areas as future economic conditions, industry-specific conditions, product pricing, and necessary capital expenditures. The use of different assumptions or estimates for future cash flows, discount rates, or terminal growth rates could produce substantially different estimates of the fair value of the reporting unit. The Company may be subject to additional goodwill impairment charges if actual results do not meet the estimates used in determining the fair value of goodwill and the associated goodwill impairment charge.

In the fourth quarter of 2020, the Company performed its annual goodwill impairment test qualitatively and concluded that it was more likely than not that there was no impairment to goodwill.

(6) Definite-lived Intangibles

As of December 28, 2020 and December 30, 2019, the components of definite-lived intangibles were as follows:

	Gross Amount	Accumulated Amortization (In thousands)	Net Carrying Amount	Weighted Average Amortization Period (In years)
December 28, 2020				
Customer relationships	\$ 397,500	\$ (150,142)	\$ 247,358	10.9
Technology	47,650	(13,701)	33,949	9.5
	<u>\$ 445,150</u>	<u>\$ (163,843)</u>	<u>\$ 281,307</u>	
December 30, 2019				
Customer relationships	\$ 396,270	\$ (111,272)	\$ 284,998	11.0
Technology	39,500	(8,064)	31,436	9.4
Acquired intangibles from acquisition in 2019				
Customer relationships	1,230	(31)	1,199	5.0
Technology	8,150	(103)	8,047	10.0
	<u>\$ 445,150</u>	<u>\$ (119,470)</u>	<u>\$ 325,680</u>	

Notes to Consolidated Financial Statements — (Continued)

Definite-lived intangibles are amortized using the straight-line method of amortization over the useful life. Amortization expense was \$44,373, \$50,598, and \$60,328 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively. For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, \$5,535, \$4,822 and \$3,345, respectively, of amortization expense is included in cost of goods sold.

Estimated aggregate amortization for definite-lived intangible assets for the next five years and thereafter is as follows:

	(In thousands)
2021	\$ 41,179
2022	38,631
2023	36,713
2024	29,713
2025	25,397
Thereafter	109,674
	<u>\$ 281,307</u>

(7) Long-term Debt and Letters of Credit

The following table summarizes the long-term debt of the Company as of December 28, 2020 and December 30, 2019:

	Interest Rate as of December 28, 2020	Principal Outstanding as of December 28, 2020	Interest Rate as of December 30, 2019	Principal Outstanding as of December 30, 2019
		(In thousands)		
Term Loan due September 2024	2.65 %	\$ 405,879	4.28 %	\$ 805,879
Senior Notes due October 2025	5.63	375,000	5.63	375,000
U.S. ABL Revolving Loan due June 2024	1.40	40,000	3.03	40,000
Asia ABL Revolving Loan due June 2024	1.55	30,000	3.18	30,000
Convertible Senior Notes due December 2020	—	—	1.75	249,975
		<u>850,879</u>		<u>1,500,854</u>
Less: Long-term debt unamortized discount		(814)		(11,943)
Long-term debt unamortized debt issuance costs		(7,212)		(12,974)
		<u>842,853</u>		<u>1,475,937</u>
Less: current maturities		—		(249,975)
Long-term debt, less current maturities		<u>\$ 842,853</u>		<u>\$ 1,225,962</u>

The fiscal calendar maturities of long-term debt through 2025 and thereafter are as follows:

	(In thousands)
2021	\$ —
2022	—
2023	—
2024	475,879
2025	375,000
Thereafter	—
	<u>\$ 850,879</u>

As of December 28, 2020, the Company was in compliance with the financial covenants under the Term Loan Facility, Senior Notes and ABL Revolving Loans.

Term Loan Facility

On April 18, 2018, the Company closed its \$600,000 commitment of incremental loans concurrent with the completion of its acquisition of Anaren. At issuance, these incremental loans increased the Company's existing balance of its Term Loan Facility due 2024 from \$348,250 to \$948,250. The Term Loan Facility had an outstanding balance of \$405,879 as of December 28, 2020 and is included in long-term debt. The Term Loan Facility was issued at a weighted average discount of 99.7% and bears interest, at the

Notes to Consolidated Financial Statements — (Continued)

Company's option, at a floating rate of LIBOR plus an applicable interest margin of 2.5%, or an alternate base rate (as defined in the Term Loan Credit Agreement) plus an applicable margin of 1.5%. As of December 28, 2020, the interest rate on the outstanding borrowings under the Term Loan Facility was 2.65%. There is no provision, other than an event of default, for the interest margin to increase. The Term Loan Facility will mature on September 28, 2024. The Term Loan Facility is secured by a significant amount of the domestic assets of the Company and a pledge of 65% of voting stock of the Company's first tier foreign subsidiaries and is structurally senior to the Company's Senior Notes and Convertible Senior Notes. See Senior Notes and Convertible Senior Notes below.

The Company has twelve months to reinvest the cash proceeds received from the sale of the Mobility business unit. If the proceeds are not reinvested, the Company is required to use the proceeds to prepay the Term Loan. The Company used a portion of the cash proceeds to repay \$400,000 of the Term Loan during the year ended December 28, 2020 and plans to use the remaining cash proceeds for reinvestment. Permitted investments, as defined in the Term Loan Credit Agreement, include extensions of trade credit in the ordinary course of business, investments in cash and cash equivalents, permitted acquisitions, investments in assets useful in the business of the Company and its restricted subsidiaries, investments in joint ventures and unrestricted subsidiaries among others.

Based on certain parameters defined in the Term Loan Facility, including a First Lien Leverage Ratio, the Company may be required to make an additional principal payment on an annual basis beginning after fiscal year 2018, if the Company's First Lien Leverage Ratio is greater than 2.0. For 2020, the Company is not required to make an additional principal payment as its First Lien Leverage Ratio was less than 2.0. Any remaining outstanding balance under the Term Loan Facility is due at the maturity date of September 28, 2024.

Borrowings under the Term Loan Facility are subject to certain affirmative and negative covenants, including limitations on indebtedness, corporate transactions, investments, dispositions, and share payments.

Senior Notes

The \$375,000 of Senior Notes issued, which is included in long-term debt, bear interest at a rate of 5.63% per annum. Interest is payable semiannually in arrears on April 1 and October 1 of each year beginning April 1, 2018. The Senior Notes will mature on October 1, 2025.

Borrowings under the Senior Notes are subject to certain affirmative and negative covenants, including limitations on indebtedness, corporate transactions, investments, dispositions, and share payments.

Convertible Senior Notes due 2020

The Convertible Senior Notes bore interest at a rate of 1.75% per annum. Interest was payable semiannually in arrears on June 15 and December 15 of each year. The Convertible Senior Notes were unsecured obligations that ranked equally to the Company's future unsecured senior indebtedness and were senior in right of payment to any of the Company's future subordinated indebtedness. Offering expenses were amortized to interest expense over the term of the Convertible Senior Notes. The Convertible Senior Notes matured and were repaid in cash in the amount of \$249,975 on December 15, 2020.

Convertible Note Hedge and Warrant Transaction: In connection with the issuance of the Convertible Senior Notes due 2020, the Company entered into a convertible note hedge and warrant transaction (Call Spread Transaction), with respect to the Company's common stock. The convertible note hedge consisted of the Company's option to purchase up to 25,939 common stock shares at a price of \$9.64 per share. The hedge could only be executed upon the conversion of the above mentioned Convertible Senior Notes due 2020 and it expired unexercised on December 15, 2020. Additionally, the Company sold equity-classified warrants to purchase 25,940 shares of its common stock at a price of \$14.26 per share. Although the Convertible Senior Notes are no longer outstanding, these warrants remain outstanding and expire ratably from March 2021 through January 2022. The Call Spread Transaction had no effect on the terms of the Convertible Senior Notes due 2020.

The components of interest expense resulting from the Convertible Senior Notes for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 were as follows:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Contractual coupon interest	\$ 4,180	\$ 4,374	\$ 4,375
Amortization of debt discount	\$ 9,926	\$ 9,751	\$ 9,142
Amortization of debt issuance costs	\$ 995	\$ 977	\$ 916

Asset-Based Lending Agreements

During June 2019, the Company amended its U.S. Asset-Based Lending Credit Agreement (U.S. ABL) and its Asia Asset-Based Lending Credit Agreement (Asia ABL) (collectively the ABL Revolving Loans). The U.S. ABL credit facility was amended to extend its maturity to June 2024 and decrease the size of the revolving credit facility to \$150,000. The Asia ABL credit facility was amended to extend the maturity to June 2024.

The U.S. ABL consists of two tranches comprised of a revolving credit facility for up to \$150,000 and a letter of credit facility for up to \$50,000, provided that at no time may amounts outstanding under the tranches exceed in aggregate \$150,000 or the applicable borrowing base, which is a percentage of the principal amount of Eligible Accounts, as defined in the U.S. ABL agreement. Borrowings under the U.S. ABL bear interest at either a floating rate of LIBOR plus a margin of 125 basis points or an alternate base rate (defined as the greater of the prime rate, the New York Fed bank rate plus 0.5% or LIBOR plus 1.0%) subject to a 1.0% floor, plus an applicable margin of 25 basis points, at the Company's option. As of December 28, 2020, the interest rate on the outstanding borrowings under the U.S. ABL was 1.40%. The applicable margin can vary based on the remaining availability of the facility, from 125 to 150 basis points for LIBOR-based loans and from 25 to 50 basis points for JP Morgan Chase Bank's prime rate-based loans. Other than availability and an event of default, there are no other provisions for the interest margin to increase. The U.S. ABL will mature on June 3, 2024. Loans made under the U.S. ABL are secured first by all of the Company's domestic cash, receivables and certain inventories as well as by a second position against a significant amount of the domestic assets of the Company and a pledge of 65% of the voting stock of the Company's first tier foreign subsidiaries and are structurally senior to the Company's Senior Notes and Convertible Senior Notes. See Senior Notes and Convertible Senior Notes above. As of December 28, 2020, \$40,000 under the U.S. ABL was outstanding and classified as long-term debt, which is consistent with its maturity date.

The Asia ABL consists of two tranches comprised of a revolving credit facility for up to \$150,000 and a letter of credit facility for up to \$100,000, provided that at no time may amounts outstanding under both tranches exceed in aggregate \$150,000 or the applicable borrowing base, which is a percentage of the principal amount of Eligible Accounts, as defined in the Asia ABL agreement. Borrowings under the Asia ABL bear interest at a floating rate of LIBOR plus 140 basis points. As of December 28, 2020, the interest rate on the outstanding borrowings under the Asia ABL was 1.55%. There is no provision, other than an event of default, for the interest margin to increase. The Asia ABL will mature on June 4, 2024. Loans made under the Asia ABL are secured by a portion of the Company's Asia Pacific cash and receivables and are structurally senior to the Company's domestic obligations, including the Senior Notes and Convertible Senior Notes. See Senior Notes and Convertible Senior Notes above. As of December 28, 2020, \$30,000 under the Asia ABL was outstanding and classified as long-term debt, which is consistent with its maturity date.

As of December 28, 2020, letters of credit in the amount of \$11,329 were outstanding under the U.S. ABL and \$13,042 were outstanding under the Asia ABL with various expiration dates through May 2021. Available borrowing capacity under the U.S. ABL and the Asia ABL was \$98,671 and \$106,958, respectively, which considers letters of credit outstanding as of December 28, 2020.

The Company is required to pay a commitment fee of 0.25% per annum on any unused portion of the U.S. ABL and 0.28% per annum on any unused portion of the Asia ABL. The Company incurred total commitment fees related to unused borrowing availability of \$541, \$703 and \$992 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively. Under the occurrence of certain events, the ABL Revolving Loans are subject to various financial and operational covenants, including maintaining minimum fixed charge coverage ratios.

Debt Issuance and Debt Discount

As of December 28, 2020 and December 30, 2019, remaining unamortized debt discount and debt issuance costs for the Term Loan Facility, Senior Notes, and Convertible Senior Notes are as follows:

	As of December 28, 2020			As of December 30, 2019		
	Debt Issuance Costs	Debt Discount	Effective Interest Rate	Debt Issuance Costs	Debt Discount	Effective Interest Rate
	(In thousands, except interest rates)					
Term Loan due September 2024	\$ 2,695	\$ 814	4.66 %	\$ 6,663	\$ 2,016	4.66 %
Senior Notes due October 2025	4,517	—	5.92	5,316	—	5.92
Convertible Senior Notes due December 2020	—	—	—	995	9,927	6.48
	<u>\$ 7,212</u>	<u>\$ 814</u>		<u>\$ 12,974</u>	<u>\$ 11,943</u>	

The above debt discount and debt issuance costs are recorded as a reduction of the debt and are amortized into interest expense using an effective interest rate over the duration of the debt.

Notes to Consolidated Financial Statements — (Continued)

Remaining unamortized debt issuance costs for the ABL Revolving Loans of \$1,919 and \$2,511 as of December 28, 2020 and December 30, 2019, respectively, are included in other non-current assets and are amortized to interest expense over the duration of the ABL Revolving Loans using the straight line method of amortization.

As of December 28, 2020, the remaining weighted average amortization period for all unamortized debt discount and debt issuance costs was 4.1 years.

(8) Income Taxes

The components of (loss) income from continuing operations before income taxes for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 are:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
United States	\$ (84,582)	\$ 16,066	\$ 18,991
Foreign	38,305	18,260	28,194
(Loss) income from continuing operations before income taxes	<u>\$ (46,277)</u>	<u>\$ 34,326</u>	<u>\$ 47,185</u>

The Company expects its earnings attributable to foreign subsidiaries will be indefinitely reinvested, except for its material Chinese and Canadian plants and the respective holding companies where a deferred tax liability of approximately \$2,458 and \$1,548 has been recorded for the foreign and U.S. federal/state impact, respectively. For those other companies with earnings currently being reinvested outside of the U.S., the undistributed earnings amounted to approximately \$60,769 as of December 28, 2020. The determination of the unrecognized deferred tax liability related to these undistributed earnings is approximately \$2,797.

The components of income tax benefit (provision) for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 are:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Current benefit (provision):			
Federal	\$ (44)	\$ 294	\$ 381
State	(4,624)	(2,922)	(1,294)
Foreign	27,902	(12,748)	(9,587)
Total current	<u>23,234</u>	<u>(15,376)</u>	<u>(10,500)</u>
Deferred benefit (provision):			
Federal	2,446	1,004	97,723
State	4,498	(1,076)	14,351
Foreign	(287)	13,043	(13,367)
Total deferred	<u>6,657</u>	<u>12,971</u>	<u>98,707</u>
Income tax benefit (provision)	<u>\$ 29,891</u>	<u>\$ (2,405)</u>	<u>\$ 88,207</u>

Notes to Consolidated Financial Statements — (Continued)

The following is a reconciliation of the provision for income taxes at the statutory federal income tax rate compared to the Company's provision for income taxes for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Statutory federal income tax benefit (provision)	\$ 9,718	\$ (7,209)	\$ (9,909)
State income taxes, net of federal benefit and state tax credits	(2,674)	(3,163)	(1,953)
Transfer pricing	—	—	1,483
Acquisition related expenses	—	—	(1,737)
IRC Section 162(m) limitation	(712)	(868)	(3,702)
Stock options	(1,298)	(252)	1,072
Global Intangible Low-Taxed Income	(1,300)	—	—
Permanently reinvested earnings assertion	(1,442)	(1,765)	(14,313)
Foreign tax differential on foreign earnings & other permanent items	3,933	687	(3,685)
Change in valuation allowance	(2,668)	2,127	118,451
Uncertain tax positions	36,936	999	(954)
Federal research and development credits	4,250	4,582	2,996
Goodwill impairment	(14,532)	—	—
Other	(320)	2,457	458
Income tax benefit (provision)	<u>\$ 29,891</u>	<u>\$ (2,405)</u>	<u>\$ 88,207</u>

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The significant components of the net deferred income tax assets (liabilities) as of December 28, 2020 and December 30, 2019 are as follows:

	As of	
	December 28, 2020	December 30, 2019
	(In thousands)	
Deferred income tax assets:		
Net operating loss carryforwards	\$ 43,209	\$ 78,774
Reserves and accruals	29,429	24,765
Interest expense limitation	—	13,102
Unrealized loss on cash flow hedge	4,713	2,960
Tax credit carryforwards	39,757	37,889
Stock-based compensation	4,216	4,440
Original issue discount on Convertible Senior Notes	90	870
Property, plant and equipment	9,989	14,404
Other deferred income tax assets	403	756
	<u>131,806</u>	<u>177,960</u>
Less: valuation allowance	<u>(15,322)</u>	<u>(14,292)</u>
	<u>116,484</u>	<u>163,668</u>
Deferred income tax liabilities:		
Repatriation of foreign earnings	(4,006)	(9,691)
Property, plant and equipment basis differences	(50,463)	(56,476)
Goodwill and intangible amortization	(39,668)	(73,263)
Other deferred income tax liabilities	(5,700)	(102)
Net deferred income tax assets (included in Deposits and other non-current assets)	<u>\$ 16,647</u>	<u>\$ 24,136</u>

Notes to Consolidated Financial Statements — (Continued)

As of December 28, 2020, the Company had the following net operating loss (NOL) carryforwards: \$117,908 in the U.S. for federal, \$25,723 in various U.S. states, \$47,957 in China, and \$26,940 in Hong Kong. The U.S. federal NOLs expire in 2027 through 2036, the various U.S. states' NOLs expire in 2021 through 2036, the China NOLs expire in 2021 through 2027, and the Hong Kong NOLs carryforward indefinitely. Further, the Company's tax credits were approximately \$48,580, of which \$6,233 carryforward indefinitely.

In connection with the Company's acquisition of Viasystems during 2015, there was more than a 50% change in ownership under Section 382 of the Internal Revenue Code of 1986, as amended, and regulations issued there under. As a consequence, the utilization of the acquired Viasystems U.S. NOLs is limited to approximately \$9,826 per year. In addition, the Company recognized certain gains built in at the time of the ownership change, which increase the limitation by approximately \$47,463 for each of the first 5 years after the acquisition. Any unused limitation in a year can be carried over to succeeding years.

A valuation allowance is provided when it is more likely than not that all or some portion of the deferred income tax assets will not be realized. During the year ended December 31, 2018, the Company released a majority of its valuation allowance recorded on its U.S. net deferred tax assets due to a combination of the Company's expectations for future U.S. taxable income improvement and to offset the net deferred tax liability acquired as a result of the Anaren acquisition. It continues to maintain a valuation allowance on certain of its U.S. net deferred tax assets represented by income tax attributes carried forward that are expected to expire unused. Certain subsidiaries within China continue to have NOL carryforwards in various tax jurisdictions that the Company has determined are not more likely than not to be utilized. As a result, a full valuation allowance has been recorded for these subsidiaries as of December 28, 2020. For the remaining net deferred income tax asset, management has determined that it is more likely than not that the results of future operations will generate sufficient taxable income to realize the net deferred tax asset.

The following summarizes the activity in the Company's valuation allowance for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Balance at beginning of year	\$ 14,292	\$ 16,635	\$ 152,728
Reduction related to acquisition	—	—	(76,040)
Additions charged to expense	3,904	1,526	—
Other reduction charged to expense	(2,874)	(3,869)	(60,053)
Balance at end of year	<u>\$ 15,322</u>	<u>\$ 14,292</u>	<u>\$ 16,635</u>

Certain entities within China qualified for the high and new technology enterprise (HNTE) status enabling those entities to enjoy certain benefits, which were effective for the years ended December 28, 2020, December 30, 2019 and December 31, 2018. The HNTE status as well as enhanced research and development (R&D) deductions decreased Chinese taxes. HNTE and R&D benefit and effect on earnings per share are as follows:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands, except per share data)		
HNTE and R&D benefits	\$ 4,235	\$ 6,060	\$ 7,277
Basic shares	106,366	105,195	103,355
Diluted shares	106,366	106,332	134,036
Increases earnings per share:			
Basic	\$ 0.04	\$ 0.06	\$ 0.07
Diluted	\$ 0.04	\$ 0.06	\$ 0.05

HNTE status expires at various dates in 2020 through 2021, but the Company expects to continue to file for renewal of such HNTE status for the foreseeable future.

Notes to Consolidated Financial Statements — (Continued)

A reconciliation of the beginning and ending amount of unrecognized tax benefits, exclusive of accrued interest and penalties, is as follows:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Balance at beginning of year	\$ 37,465	\$ 30,284	\$ 31,276
Additions related to acquisition	—	—	903
Additions based on tax positions related to the current year	839	3,553	856
Additions for tax positions of prior years	202	4,952	117
Reductions for tax positions of prior years	(27,283)	(103)	(2,140)
Lapse of statute of limitations	(3,819)	(1,221)	(728)
Balance at end of year	<u>\$ 7,404</u>	<u>\$ 37,465</u>	<u>\$ 30,284</u>

In the quarter ended December 28, 2020, the Company reduced prior years' uncertain tax positions by \$27,283 due to (i) conclusion of an examination resulting in no adjustment with the Canadian tax authority related to the pre-acquisition tax years of a Canadian subsidiary; and (ii) change in U.S. tax law related to IRC Section 163(j) with respect to the adjusted taxable income calculation.

As of December 28, 2020 and December 30, 2019, the Company recorded unrecognized tax benefits of \$1,046 and \$25,805, respectively, as well as interest and penalties of \$1,566 and \$13,531, respectively, to current and long-term liabilities. The Company has also recorded unrecognized tax benefits of \$6,358 and \$19,225 against certain deferred tax assets as of December 28, 2020 and December 30, 2019, respectively. The amount of unrecognized tax benefits that would, if recognized, reduce the Company's effective income tax rate in any future periods is \$2,612 including interest and penalties. The Company expects its unrecognized tax benefits to decrease by \$384 along with related interest of \$701 over the next twelve months due to expiring statutes.

As of December 28, 2020, the Company is open for (i) U.S. federal income tax examination for the period from 2017 to 2020 and NOL and credit carryforwards are subject to adjustment for 3 years post utilization, (ii) state and local income tax examination for tax years 2016 to 2020 and NOL and credit carryforwards are subject to adjustment for 4 years post utilization; and (iii) foreign income tax examinations generally for tax years from 2010 to 2020.

(9) Financial Instruments

Derivatives

Interest Rate Swaps

The Company's business is exposed to interest rate risk resulting from fluctuations in interest rates on certain LIBOR-based variable rate debt. Increases in interest rates would increase interest expenses relating to the outstanding variable rate borrowings and increase the cost of debt. Fluctuations in interest rates can also lead to significant fluctuations in the fair value of the debt obligations.

On May 15, 2018, the Company entered into a four-year pay-fixed, receive floating (1-month LIBOR), interest rate swap arrangement with a notional amount of \$400,000 for the period beginning June 1, 2018 and ending on June 1, 2022. Under the terms of the interest rate swap, the Company pays a fixed rate of 2.84% against a portion of its LIBOR-based debt and receives floating 1-month LIBOR during the swap period.

At inception, the Company designated the interest rate swap as a cash flow hedge and the fair value of the interest rate swap was zero. As of December 28, 2020, the fair value of the interest rate swap was recorded as a liability in the amount of \$14,968 and included as a component of other long-term liabilities. The change in the fair value of the interest rate swap is recorded as a component of accumulated other comprehensive loss, net of tax, in the Company's consolidated balance sheets. No ineffectiveness was recognized for the years ended December 28, 2020 and December 30, 2019. During the year ended December 28, 2020, the interest rate swap increased interest expense by \$8,942.

Foreign Exchange Contracts

The Company enters into foreign currency forward contracts to mitigate the impact of changes in foreign currency exchange rates and to reduce the volatility of purchases and other obligations generated in currencies other than its functional currencies. The Company's foreign subsidiaries may at times purchase forward exchange contracts to manage their foreign currency risks in relation to certain purchases of machinery denominated in foreign currencies other than the Company's functional currencies. The notional amount of the foreign exchange contracts as of December 28, 2020 and December 30, 2019 was approximately \$1,181 (Japanese Yen (JPY) 125.0 million) and \$1,994 (JPY 215.8 million), respectively. The Company has designated certain of these foreign exchange contracts as cash flow hedges.

Notes to Consolidated Financial Statements — (Continued)

The fair values of derivative instruments in the consolidated balance sheets are as follows:

		Balance Sheet Location	Asset/(Liability) Fair Value	
			December 28, 2020	December 30, 2019
(In thousands)				
Cash flow derivative instruments designated as hedges:				
Interest rate swap		Other long-term liabilities	\$ (14,968)	\$ (12,067)
Cash flow derivative instruments not designated as hedges:				
Foreign exchange contracts		Prepaid expenses and other current assets	28	1
Foreign exchange contracts		Other current liabilities	—	(3)

The following table provides information about the amounts recorded in accumulated other comprehensive loss related to derivatives designated as cash flow hedges, as well as the amounts recorded in each caption in the consolidated statements of operations when derivative amounts are reclassified out of accumulated other comprehensive loss for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

Financial Statement Caption	For the Year Ended						
	December 28, 2020		December 30, 2019		December 31, 2018		
	Loss Recognized in Other Comprehensive Loss	Loss Reclassified into Income	Loss Recognized in Other Comprehensive Loss	Loss Reclassified into Income	Loss Recognized in Other Comprehensive Loss	Loss Reclassified into Income	
(In thousands)							
Cash flow hedge:							
Interest rate swap	Interest expense	\$ (11,843)	\$ (8,942)	\$ (9,647)	\$ (2,315)	\$ (6,333)	\$ (1,598)

The following table provides a summary of the activity associated with the designated cash flow hedges reflected in accumulated other comprehensive loss for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Beginning balance, net of tax	\$ (9,617)	\$ (4,214)	\$ (742)
Changes in fair value loss, net of tax	(8,718)	(7,296)	(4,846)
Reclassification to earnings	6,720	1,893	1,374
Derecognition of unrealized losses on cash flow hedge due to sale of Mobility business unit	384	—	—
Ending balance, net of tax	\$ (11,231)	\$ (9,617)	\$ (4,214)

Based on the current yield curve, the Company expects that losses of approximately \$8,001 of accumulated other comprehensive loss will be reclassified into the statement of operations, net of tax, in the next twelve months.

(10) Accumulated Other Comprehensive Loss

The following provides a summary of the components of accumulated other comprehensive loss, net of tax as of December 28, 2020, December 30, 2019 and December 31, 2018:

	Foreign Currency Translation	Pension Obligation	(Losses) Gains on Cash Flow Hedges	Total
	(In thousands)			
Ending balance as of December 31, 2018	\$ 1,578	\$ (1,284)	\$ (4,214)	\$ (3,920)
Other comprehensive loss before reclassifications	(463)	(300)	(7,296)	(8,059)
Amounts reclassified from accumulated other comprehensive income	—	—	1,893	1,893
Net year to date other comprehensive loss	(463)	(300)	(5,403)	(6,166)
Ending balance as of December 30, 2019	1,115	(1,584)	(9,617)	(10,086)
Other comprehensive gain (loss) before reclassifications	1,745	(1,271)	(8,718)	(8,244)
Amounts reclassified from accumulated other comprehensive income	—	—	6,720	6,720
Reclassification adjustment for foreign currency translation	(346)	—	—	(346)
Derecognition of foreign currency translation adjustments due to sale of Mobility business unit	(27,341)	—	—	(27,341)
Derecognition of unrealized losses on cash flow hedge due to sale of Mobility business unit	—	—	384	384
Net year to date other comprehensive loss	(25,942)	(1,271)	(1,614)	(28,827)
Ending balance as of December 28, 2020	\$ (24,827)	\$ (2,855)	\$ (11,231)	\$ (38,913)

(11) Significant Customers and Concentration of Credit Risk

In the normal course of business, the Company extends credit to its customers. Some customers to which the Company extends credit are located outside the United States. The Company performs ongoing credit evaluations of customers, does not require collateral, and considers the credit risk profile of the entity from which the receivable is due in further evaluating collection risk.

The Company's customers include both OEMs and EMS companies. The Company's OEM customers often direct a significant portion of their purchases through EMS companies. While the Company's customers include both OEM and EMS providers, the Company measures customer concentration based on OEM companies, as they are the ultimate end customers.

For the year ended December 28, 2020, one customer accounted for approximately 11% of the Company's net sales. These sales are included in the Company's PCB segment. There were no other customers that accounted for 10% or more of net sales for the year ended December 28, 2020. There were no customers that accounted for 10% or more of net sales for the years ended December 30, 2019 or December 31, 2018.

(12) Fair Value Measures

The Company measures at fair value its financial and non-financial assets by using a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, essentially an exit price, based on the highest and best use of the asset or liability.

The carrying amount and estimated fair value of the Company's financial instruments as of December 28, 2020 and December 30, 2019 were as follows:

	As of December 28, 2020		As of December 30, 2019	
	Carrying Amount	Fair Value	Carrying Amount	Fair Value
	(In thousands)			
Derivative assets, current	\$ 28	\$ 28	\$ 1	\$ 1
Derivative liabilities, current	—	—	3	3
Derivative liabilities, non-current	14,968	14,968	12,067	12,067
Term Loan due September 2024	402,370	407,909	797,200	808,901
Senior Notes due October 2025	370,483	383,974	369,684	390,143
ABL Revolving Loans	70,000	70,000	70,000	70,000
Convertible Senior Notes due December 2020	—	—	239,053	391,686

The fair value of the derivative instruments was determined using pricing models developed based on the LIBOR swap rate, foreign currency exchange rates, and other observable market data, including quoted market prices, as appropriate using Level 2 inputs. The values were adjusted to reflect non-performance risk of both the counterparty and the Company, as necessary.

The fair value of the long-term debt was estimated based on quoted market prices or discounting the debt over its life using current market rates for similar debt as of December 28, 2020 and December 30, 2019, which are considered Level 2 inputs.

The fair value of the Convertible Senior Notes was estimated based on quoted market prices of the securities on an active exchange, which are considered Level 2 inputs.

The fair value of plan assets in the defined benefit plan of \$23,484 and \$21,287 as of December 28, 2020 and December 30, 2019, respectively, were not included in the table above and was estimated based on quoted market prices of the securities that are actively traded and price quotes that are readily available, which are considered Level 1 inputs. See Note 15 for further details of the plan assets measured at fair value in the defined benefit plan.

As of December 28, 2020 and December 30, 2019, the Company's other financial instruments also included cash and cash equivalents, accounts receivable, and accounts payable. Due to short-term maturities, the carrying amount of these instruments approximates fair value. The Company's cash and cash equivalents as of December 28, 2020 consisted of \$230,166 held in the U.S., with the remaining \$221,399 held by foreign subsidiaries.

The majority of the Company's non-financial assets and liabilities, which include goodwill, intangible assets, inventories, and property, plant and equipment, are not required to be carried at fair value on a recurring basis. However, if certain triggering events occur (or are tested at least annually in the case of goodwill) such that a non-financial instrument is required to be evaluated for impairment, based upon a comparison of the non-financial instrument's fair value to its carrying value, an impairment is recorded to reduce the carrying value to the fair value, if the carrying value exceeds the fair value.

As of December 28, 2020, the Company's goodwill balance related to its RF&S Components reporting unit of \$108,000 was measured at fair value on a nonrecurring basis. The Company recorded a goodwill impairment charge of \$69,200 during the year ended December 28, 2020. The fair value of goodwill was determined using both a DCF and a market approach, which are considered Level 3 inputs. The Company used risk adjusted discount rate of 19% to discount the expected future cash flows. There was no impairment of long-lived assets recognized for the years ended December 28, 2020, December 30, 2019 or December 31, 2018.

(13) Commitments and Contingencies***Legal Matters***

The Company is subject to various legal matters, which it considers normal for its business activities. While the Company currently believes that the amount of any reasonably possible loss for known matters would not be material to the Company's financial condition, the outcome of these actions is inherently difficult to predict. In the event of an adverse outcome, the ultimate potential loss could have a material adverse effect on the Company's financial condition or results of operations in a particular period. The Company has accrued amounts for its loss contingencies which are probable and estimable as of December 28, 2020 and December 30, 2019. However, these amounts are not material to the consolidated financial statements of the Company.

(14) Stock-Based Compensation***Incentive Compensation Plan***

The Company maintains a 2014 Incentive Compensation Plan (the Plan), which, with subsequent amendments, allows for issuance to 15,788 through its expiration date of February 2024.

The Plan provides for the grant of incentive stock options and nonqualified stock options to the Company's key employees, non-employee directors and consultants. Other types of awards such as performance-based restricted stock units (PRUs), restricted stock units (RSUs), and stock appreciation rights are also permitted. The exercise price for options and awards is determined by the compensation committee of the board of directors and, for options intended to qualify as incentive stock options, may not be less than the fair market value as determined by the closing stock price at the date of the grant. Each option and award shall vest and expire as determined by the compensation committee of the board of directors, with options, PRUs and RSUs generally vesting over three years for employees and one year for non-employee directors. Options, PRUs and RSUs do not have voting rights. Options expire no later than ten years from the grant date. All grants provide for accelerated vesting if there is a change in control, as defined in the Plan. Upon the exercise of outstanding stock options or vesting of RSUs and PRUs, the Company's practice is to issue new registered shares that are reserved for issuance under the Plan.

As of December 28, 2020, 426 PRUs, 3,121 RSUs and 60 stock options were outstanding under the Plan. Included in the 3,121 RSUs outstanding as of December 28, 2020 are 556 vested but not yet released RSUs associated with non-employee directors. These RSUs vest over one year with release of the underlying shares of common stock deferred until retirement from the board of directors, (or until one year after retirement in the case of certain prior grants).

Performance-based Restricted Stock Units

The Company maintains a long-term incentive program for executives that provides for the issuance of PRUs, representing hypothetical shares of the Company's common stock that may be issued. Under the PRU program, a target number of PRUs is awarded at the beginning of each three-year performance period. The number of shares of common stock released at the end of the performance period may range from zero to 2.4 times the target number depending on performance during the period. The performance metrics of the PRU program are based on (a) annual financial targets, which are based on revenue and EBITDA (earnings before interest, tax, depreciation, and amortization expense), each equally weighted, and (b) an overall modifier based on the Company's total stockholder return (TSR) relative to a group of peer companies selected by the Company's compensation committee, over the three-year performance period.

Under the PRU program, financial goals are set at the beginning of each fiscal year and performance is reviewed at the end of that year. The percentage to be applied to each participant's target award ranges from zero to 160% based upon the extent to which the annual financial performance goals are achieved. If specific performance threshold levels for the annual financial goals are met, the amount earned for that element will be applied to one-third of the participants' PRU award to determine the number of units earned.

At the end of the three-year performance period, the total units earned, if any, are adjusted by applying a modifier, ranging from zero to 150% based on the Company's TSR based on stock price changes relative to a group of peer companies selected by the Company's compensation committee for the same three-year period.

The TSR modifier is intended to ensure that there are limited or no payouts under the PRU program if the Company's stock performance is significantly below the median TSR of a group of peer companies selected by the Company's compensation committee over the three-year performance period. Where the annual financial goals have been met and where there has been strong relative TSR performance over the three-year performance period, the PRU program may provide substantial rewards to participants with a maximum payout of 2.4 times the initial PRU award. However, even if all of the annual financial metric goals are achieved in each of the three years, there will be no payouts if the Company's stock performance is below that of the 10th percentile for PRUs granted in 2020, 2019 and 2018 of the group of peer companies selected by the Company's compensation committee, as appropriate.

Notes to Consolidated Financial Statements — (Continued)

Recipients of PRU awards generally must remain employed by the Company on a continuous basis through the end of the three-year performance period in order to receive any amount of the PRUs covered by that award. In events such as death, disability or retirement, the recipient may be entitled to pro-rata amounts of PRUs as defined in the Plan. Target shares subject to PRU awards do not have voting rights of common stock until earned and issued following the end of the three-year performance period.

The Company records stock-based compensation expense for PRU awards granted based on management's periodic assessment of the annual financial performance goals to be achieved. As of December 28, 2020, management determined that vesting of the PRU awards was probable. PRU activity for the year ended December 28, 2020 was as follows:

	Shares (In thousands)	Weighted Average Fair Value
Outstanding shares as of December 30, 2019	216	\$ 12.14
Granted	303	10.57
Vested	(137)	12.82
Forfeited / cancelled	(22)	10.89
Change in units due to annual performance achievement	(71)	12.12
Outstanding shares as of December 28, 2020	<u>289</u>	<u>\$ 10.27</u>

The fair value of PRUs granted is calculated using a Monte Carlo simulation model, as the TSR modifier contains a market condition. For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, the following assumptions were used in determining the fair value:

	For the Year Ended		
	December 28, 2020 (1)	December 30, 2019 (2)	December 31, 2018 (3)
Weighted-average fair value	\$ 10.57	\$ 10.17	\$ 19.59
Risk-free interest rate	0.18%	2.18%	2.14%
Dividend yield	—	—	—
Expected volatility	49%	38%	40%

- (1) Reflects the weighted-averages for the third year of the three-year performance period applicable to PRUs granted in 2018, the second year of the three-year performance period applicable to PRUs granted in 2019 and the first year of the three-year performance period applicable to PRUs granted in 2020.
- (2) Reflects the weighted-averages for the third year of the three-year performance period applicable to PRUs granted in 2017, the second year of the three-year performance period applicable to PRUs granted in 2018 and the first year of the three-year performance period applicable to PRUs granted in 2019.
- (3) Reflects the weighted-averages for the third year of the three-year performance period applicable to PRUs granted in 2016, the second year of the three-year performance period applicable to PRUs granted in 2017 and the first year of the three-year performance period applicable to PRUs granted in 2018.

The risk-free interest rate for the expected term of PRUs is based on the U.S. Treasury yield curve in effect at the time of grant. Expected volatility is calculated using the Company's historical stock price.

Restricted Stock Units

RSU activity for the year ended December 28, 2020 was as follows:

	Shares (In thousands)	Weighted Average Grant-Date Fair Value
Non-vested RSUs outstanding as of December 30, 2019	2,527	\$ 11.91
Granted	1,474	11.20
Vested	(1,141)	11.48
Forfeited	(294)	11.42
Non-vested RSUs outstanding as of December 28, 2020	<u>2,566</u>	<u>\$ 11.20</u>
Vested and expected to vest through 2023 as of December 28, 2020	<u>3,121</u>	<u>\$ 11.15</u>

The fair value of the Company's RSUs is determined based upon the closing common stock price on the grant date. The weighted average fair value per unit of RSUs granted was \$11.20, \$10.09 and \$15.35 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively. The total fair value of RSUs vested for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 was \$13,093, \$13,954 and \$12,599, respectively.

Stock Options

As of December 28, 2020, stock options outstanding was 60. This is not material to the consolidated financial statements of the Company.

Stock-based Compensation Expense and Unrecognized Compensation Costs

For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, the amounts recognized in the consolidated statements of operations with respect to the stock-based compensation plan are as follows:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Cost of goods sold	\$ 3,889	\$ 3,148	\$ 2,893
Selling and marketing	1,919	1,887	1,902
General and administrative	10,083	11,568	15,676
Research and development	182	213	210
Stock-based compensation expense recognized	<u>\$ 16,073</u>	<u>\$ 16,816</u>	<u>\$ 20,681</u>

The following is a summary of total unrecognized compensation costs as of December 28, 2020:

	Unrecognized Stock-Based Compensation Cost (In thousands)	Remaining Weighted Average Recognition Period (In years)
RSU awards	\$ 20,663	1.4
PRU awards	1,898	1.6
Stock options	131	1.2
	<u>\$ 22,692</u>	

(15) Employee Benefit Plans, Deferred Compensation Plan and Retirement Benefit Plan

As of December 28, 2020, the Company has several defined contribution plans. In North America, the Company has savings plans (the Savings Plans) in which eligible full-time employees can participate and contribute a percentage of compensation subject to the maximum allowed by the tax agencies. The Savings Plans provides for a partial match by the Company. In China, the Company contributes to either separate trust-administered funds or various government-sponsored pension plans on a mandatory basis. For all defined contribution plans, the Company has no further payment obligation once the required contributions have been made. The Company recorded contributions to defined contribution plans of \$23,146, \$31,253 and \$33,106 during the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

The Company also maintains a deferred compensation plan (the Compensation Plan). The Compensation Plan is an unfunded, nonqualified deferred compensation plan and is limited to selected employees, including the Company's named executive officers and directors. The Compensation Plan allows participants to defer up to 100% of their annual bonus and between 5% and 100% of their annual director fees. Amounts deferred under the Compensation Plan will be credited to accounts maintained by the Company for each participant and will be credited or debited with the participant's proportionate share of any gains or losses attributable to the performance of investment options selected by the participant.

Following the acquisition of Anaren on April 18, 2018, the Company has a noncontributory defined benefit pension plan covering eligible employees. Effective August 15, 2000, the plan was closed for new participants. Benefits under this plan generally are based on the employee's years of service and compensation. Effective December 31, 2019, the plan is frozen as to further participation and to further benefit accruals.

As of December 28, 2020 and December 30, 2019, the funded status of the accumulated benefit obligation was 70%. The Company expects to fund a minimum required contribution of approximately \$567 during fiscal year 2021.

Notes to Consolidated Financial Statements — (Continued)

The following tables set forth the changes in benefit obligation and the plan assets in the defined benefit plan described above for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

Change in Benefit Obligations	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Benefit obligation at beginning of year	\$ (30,600)	\$ (27,661)	\$ (27,525)
Service cost	—	(397)	(292)
Interest cost	(907)	(1,109)	(758)
Amendments/curtailments/special termination	—	1,636	—
Actuarial (loss) gain	(3,146)	(4,174)	264
Benefits paid	1,183	1,105	650
Benefit obligation at end of year	\$ (33,470)	\$ (30,600)	\$ (27,661)
Accumulated benefit obligation at end of year	\$ 33,470	\$ 30,600	\$ 26,191

Change in Plan Assets	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Fair value of plan assets at beginning of year	\$ 21,287	\$ 18,251	\$ 19,643
Actual return on plan assets	2,704	3,346	(1,021)
Employer contributions	676	795	279
Benefits paid	(1,183)	(1,105)	(650)
Fair value of plan assets at end of year	\$ 23,484	\$ 21,287	\$ 18,251
Unfunded status	\$ (9,986)	\$ (9,313)	\$ (9,410)
Net amount recognized	\$ (9,986)	\$ (9,313)	\$ (9,410)

Amounts before income tax effect recognized in the consolidated balance sheets consists of the following:

	As of December 28, 2020	As of December 30, 2019
	(In thousands)	
Other long-term liabilities	\$ (9,986)	\$ (9,313)
Net amount recognized	\$ (9,986)	\$ (9,313)

Amounts before income tax effect included in accumulated other comprehensive loss as of December 28, 2020 and December 30, 2019 are as follows:

	December 28, 2020	December 30, 2019
	(In thousands)	
Net actuarial loss	\$ (3,811)	\$ (2,097)
Accumulated other comprehensive loss	\$ (3,811)	\$ (2,097)

The net actuarial loss during the year ended December 28, 2020 was primarily driven by an increase in liabilities due to a lower assumed discount rate.

The components included in the net periodic benefit cost and the increase in minimum liability included in other comprehensive loss for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 are as follows:

	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Service cost	\$ —	\$ 397	\$ 292
Interest cost	907	1,109	758
Expected return on plan assets	(1,272)	(1,228)	(920)
Net periodic benefit cost	\$ (365)	\$ 278	\$ 130

Notes to Consolidated Financial Statements — (Continued)

The weighted-average assumptions used to determine benefit obligations for this plan as of December 28, 2020, December 30, 2019 and December 31, 2018 are as follows:

	December 28, 2020	December 30, 2019	December 31, 2018
Discount rate	2.20 %	3.02 %	4.09 %
Rate of compensation increase	—	3.20	3.20
Expected return on plan assets	5.50	6.00	6.75

The Company determines the discount rate assumption based on the internal rate of return for a portfolio of high quality bonds, with a minimum rating of Moody's AA Corporate and with maturities that are consistent with the projected future cash flow obligations.

The weighted-average assumptions used to determine net periodic benefit cost for the years ended December 28, 2020, December 30, 2019 and December 31, 2018 are as follows:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
Discount rate	3.02 %	4.09 %	3.96 %
Rate of compensation increase	—	3.20	3.20
Expected return on plan assets	6.00	6.75	6.75

The Company determines the expected long-term rate of return on plan assets based upon recommendations from its pension plan's investment advisors and using an allocation approach that considers diversification and rebalancing for a portfolio of assets invested over a long-term time horizon. The approach relies on the historical returns of the plan's portfolio and relationships between equities and fixed income investments, consistent with the widely accepted capital market principle that a diversified portfolio with a larger allocation to equity investments can generate a greater return over the long run. Additionally, the Company monitors the mix of investments in its portfolio to ensure alignment with its expected long-term pension obligations. The Company reviews the expected long-term rate of return annually and revises it as appropriate.

Investments shall be made pursuant to the following objectives: 1) preserve the purchasing power of the plan's assets adjusted for inflation; 2) provide long-term growth; 3) avoid significant volatility. Asset allocation shall be determined based on a long-term target allocation having 29% of assets invested in large-cap stocks, 11% in mid-cap stocks, 11% in small-cap stocks, 11% in international stocks, 34% in the broad bond market, and 3% in the real estate market, with little or none invested in cash. Both the investment allocation and the plan performance are reviewed periodically.

The target allocation for 2021 and the plan asset allocation at the end of 2020 and 2019, in percentages, by asset category are as follows:

	Target Allocation 2021	December 28, 2020	December 30, 2019
Equity securities (1)	67 %	68 %	66 %
Debt securities (2)	30	30	31
Cash and cash equivalents (3)	3	2	3
Total	100 %	100 %	100 %

Notes to Consolidated Financial Statements — (Continued)

The following table summarizes plan assets measured at fair value as of December 28, 2020 and December 30, 2019:

	As of December 28, 2020			
	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	(In thousands)			
Equity securities (1)	\$ 15,922	\$ 15,922	\$ —	\$ —
Debt securities (2)	7,015	7,015	—	—
Cash and cash equivalents (3)	547	547	—	—
Total	\$ 23,484	\$ 23,484	\$ —	\$ —

	As of December 30, 2019			
	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	(In thousands)			
Equity securities (1)	\$ 14,131	\$ 14,131	\$ —	\$ —
Debt securities (2)	6,488	6,488	—	—
Cash and cash equivalents (3)	668	668	—	—
Total	\$ 21,287	\$ 21,287	\$ —	\$ —

- (1) Equity securities include U.S. and foreign exchange traded common and preferred stocks and mutual funds. Common and preferred shares issued by U.S. and non-U.S. corporations are traded actively on exchanges and price quotes for these shares are readily available. Holdings of corporate stock are categorized as Level 1 investments.
- (2) Debt securities include the debt of the U.S. Treasury and U.S. and foreign corporate issuers. U.S. Treasury notes and bonds are actively traded and price quotes for these securities are readily available. Holdings of U.S. Treasury notes and bonds are categorized as Level 1 investments.
- (3) Cash and cash equivalents include short-term U.S. government investment notes, short-term money market mutual funds, accrued income and cash held on account. Cash held on account and short-term U.S. government investment notes (including accrued income thereon) for which there is an active market and daily pricing for the security are categorized as Level 1 investments.

The Company seeks to maximize medium to long-term returns of the overall pension plan assets with reasonable levels of investment risk. One element of controlling the overall investment risk is through diversification of asset allocation, among domestic and international equity and debt instruments. The plan's equity investments include foreign and domestic exchange traded equities across a range of industries and countries, but primarily in the domestic markets. The plan's debt securities are primarily invested in government and corporate issuers primarily in the domestic market.

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid:

	(In thousands)
2021	\$ 1,294
2022	1,335
2023	1,421
2024	1,514
2025	1,572
Years 2026 through 2030	8,513

(16) Preferred Stock

The board of directors has the authority, without action by stockholders, to designate and issue preferred stock in one or more series. The board of directors may also designate the rights, preferences and privileges of each series of preferred stock, any or all of which may be superior to the rights of the common stock. As of December 28, 2020, no shares of preferred stock were outstanding.

(17) Segment Information

The reportable segments shown below are the Company's segments for which separate financial information is available and upon which operating results are evaluated by the chief operating decision maker to assess performance and to allocate resources. During the year ended December 28, 2020, the Company's RF&S Components operating segment met the quantitative threshold for separate presentation of a reportable segment. In prior periods, the Company had two reportable segments: PCB and E-M Solutions. The RF&S Components reportable segment was previously aggregated with the PCB reportable segment. As a result, certain prior year amounts have been reclassified to conform with this new presentation. The PCB reportable segment consists of fifteen domestic PCB and sub-system plants; five PCB fabrication plants in China; and one in Canada. The RF&S reportable segment consists of one domestic RF component plant and one RF component plant in China. The E-M Solutions reportable segment consists of three custom electronic assembly plants in China, two of which were closed in the fourth quarter of 2020. As a result, the Company will no longer be reporting E-M Solutions operating segment in 2021. See Note 20 for further details.

The Company, including the chief operating decision maker, evaluates segment performance based on reportable segment income, which is operating income before amortization of intangibles. Interest expense and interest income are not presented by segment since they are not included in the measure of segment profitability reviewed by the chief operating decision maker. All inter-segment transactions have been eliminated.

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
(In thousands)			
Net Sales:			
PCB	\$ 1,905,243	\$ 1,844,562	\$ 1,959,090
RF&S Components	44,656	62,315	52,705
E-M Solutions	155,423	226,333	225,947
Total net sales	<u>\$ 2,105,322</u>	<u>\$ 2,133,210</u>	<u>\$ 2,237,742</u>
Operating Segment Income (Loss):			
PCB	\$ 262,304	\$ 233,642	\$ 262,143
RF&S Components	(56,671)	29,376	24,713
E-M Solutions	(20,738)	7,119	8,105
Corporate	(112,430)	(109,910)	(115,662)
Total operating segment income	72,465	160,227	179,299
Amortization of definite-lived intangibles ⁽¹⁾	(44,373)	(50,598)	(60,328)
Total operating income	28,092	109,629	118,971
Total other expense	(74,369)	(75,303)	(71,786)
(Loss) income before income taxes	<u>\$ (46,277)</u>	<u>\$ 34,326</u>	<u>\$ 47,185</u>

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
(In thousands)			
Depreciation Expense:			
PCB	\$ 79,300	\$ 80,239	\$ 81,138
RF&S Components	1,742	1,720	1,120
E-M Solutions	9,843	3,476	2,850
Corporate	8,687	7,935	6,221
Total depreciation expense	<u>\$ 99,572</u>	<u>\$ 93,370</u>	<u>\$ 91,329</u>

Capital Expenditures:			
PCB	\$ 64,285	\$ 102,984	\$ 76,109
RF&S Components	1,514	3,683	2,104
E-M Solutions	722	2,302	3,918
Corporate	5,804	8,437	7,758
Total capital expenditures	<u>\$ 72,325</u>	<u>\$ 117,406</u>	<u>\$ 89,889</u>

TTM TECHNOLOGIES, INC.
Notes to Consolidated Financial Statements — (Continued)

	As of	
	December 28, 2020	December 30, 2019
(In thousands)		
Segment Assets:		
PCB (2)	\$ 1,489,121	\$ 2,088,229
RF&S Components	227,990	38,536
E-M Solutions	128,109	156,580
Corporate	1,050,724	1,277,588
Total assets	\$ 2,895,944	\$ 3,560,933

(1) Amortization of definite-lived intangibles primarily relates to the PCB and RF&S Components reportable segments. For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, \$5,535, \$4,822 and \$3,345, respectively, of amortization expense is included in cost of goods sold.

(2) Segment assets for the PCB reportable segment as of December 30, 2019 include the Company's Mobility business unit's assets amounting to \$493,169.

The Corporate category primarily includes operating expenses that are not included in the segment operating performance measures. Corporate consists primarily of corporate governance functions such as finance, accounting, information technology, facilities and human resources personnel, as well as global sales and marketing personnel, research and development costs, and acquisition and integration costs associated with acquisitions and divestitures. Bank fees and legal, accounting, and other professional service costs associated with acquisitions and divestitures of \$273, \$6,902 and \$13,279 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively, are included in Corporate.

The Company markets and sells its products in approximately 53 countries. Other than in the United States and China, the Company does not conduct business in any country in which its net sales in that country exceed 10% of the Company's total net sales. Net sales and long-lived assets are as follows:

	2020		2019		2018	
	Net Sales	Long-Lived Assets	Net Sales	Long-Lived Assets	Net Sales	Long-Lived Assets
(In thousands)						
United States	\$ 1,086,440	\$ 1,154,218	\$ 1,118,725	\$ 1,348,741	\$ 977,265	\$ 1,315,174
China	334,462	387,627	341,779	335,191	354,931	378,978
Other	684,420	27,221	672,706	26,473	905,546	28,029
Total	\$ 2,105,322	\$ 1,569,066	\$ 2,133,210	\$ 1,710,405	\$ 2,237,742	\$ 1,722,181

Net sales are attributed to countries by country invoiced.

Notes to Consolidated Financial Statements — (Continued)

(18) Earnings Per Share

The following is a reconciliation of the numerator and denominator used to calculate basic earnings per share and diluted earnings per share from continuing operations for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands, except per share amounts)		
Net (loss) income from continuing operations	\$ (16,386)	\$ 31,921	\$ 135,392
Diluted (loss) earnings:			
Net (loss) income from continuing operations	\$ (16,386)	\$ 31,921	\$ 135,392
Interest expense from Convertible Senior Notes, net of tax	—	—	11,906
Diluted (loss) earnings	\$ (16,386)	\$ 31,921	\$ 147,298
Basic weighted average shares	106,366	105,195	103,355
Dilutive effect of performance-based restricted stock units, restricted stock units and stock options	—	1,137	1,677
Dilutive effect of outstanding warrants	—	—	3,065
Dilutive effect of assumed conversion of Convertible Senior Notes outstanding	—	—	25,939
Diluted shares	106,366	106,332	134,036
(Loss) earnings per share:			
Basic	\$ (0.15)	\$ 0.30	\$ 1.31
Diluted	\$ (0.15)	\$ 0.30	\$ 1.10

For the years ended December 28, 2020, December 30, 2019 and December 31, 2018, PRUs, RSUs and stock options to purchase 433, 730 and 528 shares of common stock, respectively, were not included in the computation of diluted earnings per share. The PRUs were not included in the computation of diluted earnings per share because the performance conditions had not been met at December 28, 2020, and for RSUs and stock options, the options' exercise prices or the total expected proceeds under the treasury stock method was greater than the average market price of common shares during the applicable year and, as a result, the impact would be anti-dilutive.

The below is a summary of amounts convertible to common stock related to Convertible Senior Notes and related warrants:

	For the Year Ended		
	December 28, 2020	December 30, 2019	December 31, 2018
	(In thousands)		
Common stock related to Convertible Senior Notes	—	25,938	25,939
Warrants to purchase common stock	25,940	25,940	25,940

During the year ended December 28, 2020, the Company calculated the dilutive effect of Convertible Senior Notes using the treasury stock method because the Company repaid and settled the Convertible Senior Notes in cash. This change in policy from the if-converted method to treasury stock method was applied on a prospective basis. For the year ended December 28, 2020, the effect of shares of common stock related to the Company's Convertible Senior Notes were not included in the computation of dilutive earnings per share as the impact would be anti-dilutive due to the net loss from continuing operations. For the year ended December 30, 2019, the effect of shares of common stock related to the Company's Convertible Senior Notes, based on the if-converted method, were not included in the computation of dilutive earnings per share as the impact would be anti-dilutive.

Outstanding warrants for the years ended December 28, 2020 and December 30, 2019, to purchase common stock were not included in the computation of dilutive earnings per share because the strike price of the warrants to purchase the Company's common stock were greater than the average market price of common shares during the applicable year, and therefore, the effect would be anti-dilutive.

(19) Related Party Transactions

In the normal course of business, the Company's foreign subsidiaries purchase laminate and prepreg from related parties in which a former member of the Board of Directors of the Company holds an equity interest. The Company no longer has a related party relationship under ASC Topic 850, *Related Party Disclosures*, with this former member of the Board of Directors as of December 28, 2020 (resigned on May 9, 2020). The Company's foreign subsidiaries purchased laminate and prepreg from these related parties in the amount of \$25,175, \$30,612 and \$39,462 for the years ended December 28, 2020, December 30, 2019 and December 31, 2018, respectively.

The Company also sells PCBs to a related party which is a wholly owned subsidiary of an entity in which a former member of the Board of Directors of the Company holds an equity interest. The Company no longer has a related party relationship under ASC Topic 850, *Related Party Disclosures*, with this former member of the Board of Directors as of December 28, 2020 (resigned on May 9, 2020). Sales to this related party for the years ended December 28, 2020 and December 30, 2019 were \$32 and \$244, respectively. There were no sales to this related party for the year ended December 31, 2018.

As of December 30, 2019, the Company's consolidated balance sheet included \$9,220 in accounts payable due to related parties for purchases of laminate and prepreg and such balance is included as a component of accounts payable on the consolidated balance sheet.

(20) Restructuring Charges

On April 29, 2020, the Company announced the restructuring of its E-M Solutions business unit. The E-M Solutions business unit consists of three Chinese manufacturing facilities with two being in Shanghai (SH BPA and SH E-MS) and one in Shenzhen (SZ). The Company ceased operations at the SH E-MS and SZ facilities while integrating the SH BPA facility into its PCB operations. The restructuring is another step in advancing the Company's stated strategy of increasing its focus on differentiated higher margin products that more fully leverage the Company's early engagement capabilities and industry leading engineering-based technology solutions. The Company closed the SH E-MS and SZ facilities in the fourth quarter of 2020. As of December 28, 2020, the Company has incurred approximately \$16,573 of restructuring charges and \$6,705 of accelerated depreciation expense since the April 29, 2020 announcement.

In connection with the restructuring of its E-M Solutions business unit and other global realignment restructuring efforts, the Company recognized employee separation, contract termination and other costs during the years ended December 28, 2020, December 30, 2019, and December 31, 2018. Contract termination and other costs primarily represented plant closure costs.

The below table summarizes such restructuring costs by reportable segment for the years ended December 28, 2020, December 30, 2019 and December 31, 2018:

	December 28, 2020			For the Year Ended December 30, 2019			December 31, 2018		
	Employee Separation/ Severance	Contract Termination and Other Costs	Total	Employee Separation/ Severance	Contract Termination and Other Costs	Total	Employee Separation/ Severance	Contract Termination and Other Costs	Total
(In thousands)									
Reportable Segment:									
PCB	\$ —	\$ 14	\$ 14	\$ 5,218	\$ —	\$ 5,218	\$ 1,150	\$ —	\$ 1,150
RF&S Components	—	—	—	52	—	52	—	—	—
E-M Solutions	15,251	1,322	16,573	—	—	—	—	—	—
Corporate	19	158	177	80	30	110	3,389	121	3,510
	<u>\$ 15,270</u>	<u>\$ 1,494</u>	<u>\$ 16,764</u>	<u>\$ 5,350</u>	<u>\$ 30</u>	<u>\$ 5,380</u>	<u>\$ 4,539</u>	<u>\$ 121</u>	<u>\$ 4,660</u>

Notes to Consolidated Financial Statements — (Continued)

Accrued restructuring costs are included as a component of other current liabilities in the consolidated balance sheets. The below table shows the utilization of the accrued restructuring costs during the years ended December 28, 2020 and December 30, 2019:

	Employee Separation/ Severance	Contract Termination and Other Costs	Total
	(In thousands)		
Accrued as of December 31, 2018	\$ 3,158	\$ 393	\$ 3,551
Charged to expense	5,350	30	5,380
Amount paid	(8,248)	(181)	(8,429)
Accrued as of December 30, 2019	\$ 260	\$ 242	\$ 502
Charged to expense	15,270	1,494	16,764
Amount paid	(8,467)	(1,417)	(9,884)
Accrued as of December 28, 2020	\$ 7,063	\$ 319	\$ 7,382

(21) Subsequent Events

On February 3, 2021, the Company announced that its Board of Directors authorized and approved a share repurchase program. Under the program, the Company may repurchase up to \$100,000 in value of the Company's outstanding shares of common stock from time to time through February 3, 2023. The Company may repurchase shares through open market purchases, privately-negotiated transactions, or otherwise in accordance with applicable federal securities laws, including Rule 10b-18 of the Exchange Act which sets certain restrictions on the method, timing, price and volume of open market stock repurchases. In addition, the Company expects to adopt one or more trading plans in accordance with Rule 10b5-1 of the Exchange Act to facilitate certain purchases that may be effected under the share repurchase program. The timing, manner, price and amount of any repurchases will be determined at the Company's discretion, and the share repurchase program may be suspended, terminated or modified at any time for any reason. The repurchase program does not obligate the Company to acquire any specific number of shares.

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

As of December 28, 2020, TTM Technologies, Inc. (“we,” “us” or “our”) had one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended: our common stock, par value \$0.001 per share.

DESCRIPTION OF COMMON STOCK

The following description of our common stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our certificate of incorporation, as amended, and our fourth amended and restated bylaws, each of which are incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.10 is a part. We encourage you to read our certificate of incorporation, our bylaws, and the applicable provisions of the Delaware General Corporation Law for additional information.

We are authorized to issue, under our certificate of incorporation, as amended, we had the authority to issue 300,000,000 shares of common stock and 15,000,000 shares of preferred stock, par value \$0.001 per share. No shares of preferred stock are currently outstanding.

Voting Rights

Each outstanding share of our common stock is entitled to one vote per share of record on all matters submitted to a vote of stockholders and to vote together as a single class for the election of directors and in respect of other corporate matters. At a meeting of stockholders at which a quorum is present, for all matters other than the election of directors, all questions shall be decided by the vote of the holders of a majority of the outstanding shares of stock entitled to vote thereon present in person or by proxy at the meeting, unless the matter is one upon which a different vote is required by express provision of law or our certificate of incorporation, as amended, or fourth amended and restated bylaws, as amended. Directors will be elected by a plurality of the votes of the shares present at a meeting. Holders of shares of common stock do not have cumulative voting rights with respect to the election of directors or any other matter.

Dividends

Holders of our common stock are entitled to receive dividends or other distributions when, as, and if declared by our board of directors. The right of our board of directors to declare dividends, however, is subject to any rights of the holders of other classes of our capital stock, any indebtedness outstanding from time to time, and the availability of sufficient funds under Delaware law to pay dividends.

Preemptive Rights

The holders of our common stock do not have preemptive rights to purchase or subscribe for any of our capital stock or other securities.

Redemption

The shares of our common stock are not subject to redemption by operation of a sinking fund or otherwise.

Liquidation Rights

In the event of any liquidation, dissolution, or winding up of our company, after the payment or provisions for payment of all debts and liabilities of the corporation and all preferential amounts to which the holders of our preferred stock are entitled with respect to the distribution of assets in liquidation, the holders of shares of our common stock are entitled to receive any of our assets available for distribution to our stockholders ratably in proportion to the number of shares held by them.

Anti-takeover Effects of Certain Provisions of Delaware Law

We are subject to Section 203 of Delaware Law, which prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years after the date that such stockholder became an interested stockholder, with the following exceptions:

- before such date, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested holder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction began, excluding for purposes of determining the voting stock outstanding (but not the outstanding voting stock owned by the interested stockholder) those shares owned (i) by persons who are directors and also officers and (ii) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or after such date, the business combination is approved by the board of directors and authorized at an annual or special meeting of the stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

In general, Section 203 defines business combination to include the following:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;

- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits by or through the corporation.

In general, Section 203 defines an “interested stockholder” as an entity or person who, together with the person’s affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation.

Listing

Our common stock is listed on the NASDAQ Global Select Market under the symbol “TTMI.”

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company. Its address is 6201 15th Avenue, Brooklyn, New York 11219, and its telephone number is (800) 937-5449.

**LIST OF SUBSIDIARIES OF
TTM TECHNOLOGIES, INC.**

<u>Name of Subsidiary</u>	<u>State/Country of Incorporation</u>	<u>Parent</u>
TTM Iota Limited	Bermuda	TTM Technologies International (Switzerland) GmbH
TTM Technologies (Shanghai) Co. Ltd.	China	TTM Iota Limited
TTM Technologies (Asia Pacific) Limited	Hong Kong	TTM Technologies International Limited
Merix Caymans Trading Company Limited	Cayman Islands	TTM Technologies International Limited
TTM Technologies International Limited	Cayman Islands	TTM Technologies North America, LLC
Meadville Aspocomp (BVI) Holdings Limited	British Virgin Islands	TTM Technologies (Asia Pacific) Limited
Meadville Aspocomp International Limited	Hong Kong	Meadville Aspocomp (BVI) Holdings Limited
Asia Rich Enterprises Limited	British Virgin Islands	Meadville Aspocomp (BVI) Holdings Limited
Aspocomp Electronics India Private Limited	India	Asia Rich Enterprises Limited
MTG Management (BVI) Limited	British Virgin Islands	TTM Technologies (Asia Pacific) Limited
Oriental Printed Circuits Limited	Hong Kong	MTG Management (BVI) Limited
MTG PCB (BVI) Limited	British Virgin Islands	TTM Technologies (Asia Pacific) Limited
TTM Technologies China Limited	Hong Kong	MTG PCB (BVI) Limited
OPC Manufacturing Limited	Hong Kong	TTM Technologies China Limited
TTM Technologies Trading (Guangzhou) Co., Ltd.	China	TTM Technologies China Limited
Dongguan Meadville Circuits Limited	China	TTM Technologies China Limited
TTM Technologies North America, LLC	Delaware	TTM Technologies, Inc.
DDi Cleveland Holdings Corp.	Delaware	TTM Technologies North America, LLC
DDi Electronics Services (Shenzhen) Co. Ltd.	China	TTM Technologies North America, LLC
Wirekraft Industries, LLC	Delaware	TTM Technologies North America, LLC
TTM Technologies Europe Limited	United Kingdom	TTM Technologies North America, LLC
TTM Technologies Toronto, Inc.	Ontario	TTM Technologies North America, LLC
TTM Technologies Trading (Asia) Company Limited	Hong Kong	TTM Technologies International Limited
Viasystems Services (Singapore) PTE Ltd.	Singapore	Merix Caymans Trading Company Limited
Merix Printed Circuits Technology Limited	China	Viasystems Services (Singapore) PTE Ltd.
Viasystems (BVI) Limited	British Virgin Islands	Merix Caymans Trading Company Limited
Kalex Circuit Board (Guangzhou) Limited	Hong Kong	Viasystems (BVI) Limited
Guangzhou Termbray Circuit Board Company Limited	China	Kalex Circuit Board (Guangzhou) Limited
Viasystems Kalex Printed Circuit Board Limited	Hong Kong	Viasystems (BVI) Limited
Termbray Laminate Company Limited	Hong Kong	Viasystems (BVI) Limited
TTM Technologies Services (BVI) Limited	British Virgin Islands	Viasystems (BVI) Limited
Viasystems Asia Pacific Company Limited	Hong Kong	Viasystems (BVI) Limited
TTM Technologies (Hong Kong) Co., Ltd.	Hong Kong	Viasystems (BVI) Limited
Guangzhou Kalex Laminate Company Limited	China	Termbray Laminate Company Limited
Guangzhou Viasystems Commercial Technology Co. Limited	China	TTM Technologies Services (BVI) Limited
TTM Technologies International (Switzerland) GmbH	Switzerland	Viasystems Asia Pacific Company Limited

<u>Name of Subsidiary</u>	<u>State/Country of Incorporation</u>	<u>Parent</u>
Viasystems EMS (Shenzhen) Co. Ltd.	China	Viasystems Asia Pacific Company Limited
Shanghai Viasystems EMS Co. Ltd.	China	Viasystems Asia Pacific Company Limited
Guangzhou Termbray Electronics Technologies Company Limited	China	TTM Technologies (Hong Kong) Co., Ltd.
Kalex Multilayer Circuit Board (Zhongshan) Ltd.	China	TTM Technologies (Hong Kong) Co., Ltd.
Metropole A Limited	Hong Kong	Merix Caymans Trading Company Limited
Metropole B Limited	Hong Kong	Merix Caymans Trading Company Limited
Viasystems B.V.	Netherlands	TTM Technologies North America, LLC
Print Service Holding N.V.	Netherlands	Viasystems B.V.
Viasystems Mommers B.V.	Netherlands	Print Service Holding N.V.
Viasystems Services B.V.	Netherlands	Viasystems B.V.
Anaren, LLC	Delaware	TTM Technologies, Inc.
Anaren Ceramics, Inc.	New Hampshire	Anaren, LLC
Anaren Communication (Suzhou) Co. Ltd.	China	Anaren, LLC
Anaren GP, Inc.	New York	Anaren, LLC
Anaren Microwave, Inc.	Delaware	TTM Technologies, Inc.
Unicircuit, Inc.	Colorado	TTM Technologies, Inc.
TTM Technologies Japan Kabushiki Kaisha	Japan	TTM Technologies North America, LLC
TTM Printed Circuit Group, LLC	Delaware	TTM Technologies, Inc.

Consent of Independent Registered Public Accounting Firm

The Board of Directors
TTM Technologies, Inc.:

We consent to the incorporation by reference in the registration statements (Nos. 333-46454, 333-138219, 333-198117, and 333-211744) on Form S-8 of TTM Technologies, Inc. of our report dated February 22, 2021, with respect to the consolidated balance sheets of TTM Technologies, Inc. as of December 28, 2020 and December 30, 2019, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 28, 2020, and the related notes, and the effectiveness of internal control over financial reporting as of December 28, 2020, which report appears in the December 28, 2020 annual report on Form 10-K of TTM Technologies, Inc.

Our report dated February 22, 2021 refers to a change in the Company's method of accounting for leases in fiscal 2019 due to the adoption of the Financial Accounting Standards Board's (FASB) Accounting Standards Codification (ASC) Topic 842, *Leases*.

/s/ KPMG LLP

Irvine, California
February 22, 2021

CERTIFICATION

I, Thomas T. Edman, certify that:

1. I have reviewed this annual report on Form 10-K of TTM Technologies, Inc.;

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

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

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

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

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

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

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

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

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

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

/s/ Thomas T. Edman

Thomas T. Edman
President and Chief Executive Officer
(Principal Executive Officer)

Date: February 22, 2021

CERTIFICATION

I, Todd B. Schull, certify that:

1. I have reviewed this annual report on Form 10-K of TTM Technologies, Inc.;

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

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

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

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

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

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

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

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

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

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

/s/ Todd B. Schull

Todd B. Schull
Executive Vice President and Chief Financial Officer
(Principal Financial Officer and Principal
Accounting Officer)

Date: February 22, 2021

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of TTM Technologies, Inc. (the "Company") for the year ended December 28, 2020, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Thomas T. Edman, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934(15 U.S.C. 78m(a) or 78o(d)); and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By: /s/ Thomas T. Edman

Thomas T. Edman
President and Chief Executive Officer
(Principal Executive Officer)

February 22, 2021

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of TTM Technologies, Inc. (the "Company") for the year ended December 28, 2020, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Todd B. Schull, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934(15 U.S.C. 78m(a) or 78o(d)); and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By: /s/ Todd B. Schull

Todd B. Schull
*Executive Vice President and Chief Financial Officer
(Principal Financial Officer and Principal
Accounting Officer)*

February 22, 2021