SILICON LABORATORIES INC
Form 10-K
January 30, 2019

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 29, 2018

or

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

For the transition period from to
Commission file number: 000-29823

SILICON LABORATORIES INC.

(Exact name of registrant as specified in its charter)

Delaware	**74-2793174**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
400 West Cesar Chavez, Austin, Texas	**78701**
(Address of principal executive offices)	(Zip Code)

(512) 416-8500
(Registrant's telephone number, including area code)

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

Title of each class	**Name of exchange on which registered**
Common Stock, $0.0001 par value	The NASDAQ Stock Market LLC

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

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

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

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Sections 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. ý Yes o 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). ý Yes o No

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

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 ý	Accelerated filer o	Non-accelerated filer o	Smaller reporting company o
			Emerging growth company o

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. o

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold as of the last business day of the registrant's most recently completed second fiscal quarter (June 29, 2018) was approximately $4.2 billion (assuming, for this purpose, that only directors and officers are deemed affiliates).

There were 43,088,623 shares of the registrant's common stock issued and outstanding as of January 21, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the registrant's 2018 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K.

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Cautionary Statement

Except for the historical financial information contained herein, the matters discussed in this report on Form 10-K (as well as documents incorporated herein by reference) may be considered "forward-looking" statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Such forward-looking statements include declarations regarding the intent, belief or current expectations of Silicon Laboratories Inc. and its management and may be signified by the words "believe," "estimate," "expect," "intend," "anticipate," "plan," "project," "will" or similar language. You are cautioned that any such forward-looking statements are not guarantees of future performance and involve a number of risks and uncertainties. Actual results could differ materially from those indicated by such forward-looking statements. Factors that could cause or contribute to such differences include those discussed under "Risk Factors" and elsewhere in this report. Silicon Laboratories disclaims any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

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Part I

Item 1. Business

General

Silicon Laboratories Inc. is a leading provider of silicon, software and solutions for a smarter, more connected world. Our award-winning technologies are shaping the future of the Internet of Things (IoT), Internet infrastructure, industrial automation, consumer and automotive markets. Our world-class engineering team creates products focused on performance, energy savings, connectivity and simplicity.

Our primary semiconductor products are mixed-signal integrated circuits (ICs), which are electronic components that convert real-world analog signals, such as sound and radio waves, into digital signals that electronic products can process. Our mixed-signal ICs leverage standard complementary metal oxide semiconductor (CMOS), a low cost, widely available process technology. Use of CMOS technology enables smaller, more cost-effective and energy-efficient solutions. Our expertise in analog-intensive, mixed-signal IC design in CMOS allows us to develop new and innovative products that are highly integrated, simplifying our customers' designs and improving their time-to-market.

Industry Background

The pervasiveness of connectivity and mobile devices is driving semiconductor consumption. Intelligence is being added to electronic systems to enable Internet connectivity, power efficiency and an improved user experience. This in turn is increasing the demand for bandwidth, requiring more infrastructure to support higher performance networks. The nearly ubiquitous availability of Internet access and the increasing intelligence of electronic devices and mobility are enabling what is called the Internet of Things, a term that describes the exponential increase in IP-enabled devices connected to the Internet.

These trends require more and more interaction between the analog world we live in and the digital world of computing, which is driving the need for analog-intensive, mixed-signal circuits in a wide range of electronic products. Traditional mixed-signal designs relied upon solutions built with numerous, complex discrete analog and digital components. While these traditional designs provide the required functionality, they are often inefficient and inadequate for use in markets where size, cost, power consumption and performance are increasingly important product differentiators. To improve their competitive position, electronics manufacturers must reduce the cost and complexity of their systems and enable new features or functionality to differentiate themselves from their competitors.

Simultaneously, these manufacturers face accelerating time-to-market demands and must rapidly adapt to evolving industry standards and new technologies. Because analog-intensive, mixed-signal design expertise is difficult to find, these manufacturers increasingly are turning to third parties, like us, to provide advanced mixed-signal solutions. Mixed-signal design requires specific expertise and relies on creative, experienced engineers to deliver solutions that optimize speed, power and performance, despite the noisy digital environment, and within the constraints of standard manufacturing processes. The development of this design expertise typically requires years of practical analog design experience under the guidance of a senior engineer, and engineers with the required level of skill and expertise are in short supply.

Many IC solution providers lack sufficient analog expertise to develop compelling mixed-signal products. As a result, manufacturers of electronic devices value providers that can supply them with mixed-signal solutions offering greater functionality, smaller size and lower power requirements at a reduced cost and shorter time-to-market.

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Products

We provide analog-intensive, mixed-signal solutions for use in a variety of electronic products in a broad range of applications for the IoT including connected home and security, industrial, smart energy, consumer, automotive and lighting applications. We are a supplier of wireless connectivity solutions for the IoT based on Zigbee®, sub-GHz proprietary technologies, Bluetooth®, Z-Wave®, Thread, and Wi-Fi®.

We provide a wide range of timing and isolation products for infrastructure applications including high-performance clocks and oscillators for networking equipment, data centers and wireless base stations, as well as digital isolators and current sensors for industrial power supplies, motor control, solar inverters and hybrid-electric vehicles. We also provide broadcast products, such as TV tuners and demodulators and automotive radio tuners, and access products including subscriber line interface circuits for voice over IP (VoIP), embedded modems, and Power over Ethernet (PoE) power source equipment and powered device ICs.

Our products integrate complex mixed-signal functions that are frequently performed by numerous discrete components in competing products into a single chip or chipset. By doing so, we create products that, when compared to many competing products, offer the following benefits:

Require less printed circuit board (PCB) space;

Reduce the use of external components lowering the system cost and simplifying design;

Offer superior performance improving our customers' end products;

Provide increased reliability and manufacturability, improving customer yields; and/or

Reduce system power requirements enabling smaller form factors and/or longer battery life.

We group our products into the following categories:

Internet of Things products, which include our microcontroller (MCU), wireless and sensor products;

Broadcast products, which include our broadcast consumer and automotive products;

Infrastructure products, which include our timing products (clocks and oscillators), and isolation devices; and

Access products, which include our Voice over IP (VoIP) products, embedded modems and Power over Ethernet (PoE) devices.

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The following table summarizes the diverse product areas and applications for the various products that we have introduced to customers:

Product Areas and Description	**Applications**
Internet of Things Products	
Microcontrollers and Wireless Products We offer a family of products ideal for embedded systems that include energy friendly 8-bit mixed-signal microcontrollers, 32-bit wireless MCUs and ultra-low-power 32-bit MCUs based on scalable ARM® Cortex-M0+/M3/M4 cores, as well as wireless connectivity devices such as our multiprotocol Wireless Gecko system-on-chip (SoC) devices. Our wireless modules provide flexible, highly integrated products that meet demanding requirements and can be used in many applications. Our wireless connectivity solutions for the IoT are based on Zigbee, sub-GHz proprietary technologies, Bluetooth, Z-Wave, Thread and Wi-Fi. Our EFM32 , EFM8 , 8051, wireless MCUs and wireless SoCs are supported by Simplicity Studio , which provides one-click access to design tools, documentation, software and support resources. We also offer a Micrium® real-time operating system (RTOS) to help simplify software development for IoT applications by coordinating and prioritizing multiprotocol connectivity, SoC peripherals and other system-level activities. Our broad portfolio addresses a variety of target markets, including smart home, commercial (building automation and retail) and industrial (smart energy, factory automation, smart cities).	Home automation Security systems Smart lighting Smart metering Wearables Industrial automation and control Consumer electronics Medical instrumentation Automotive sensors and controls

Sensors
Our sensor products include optical sensors (proximity, ambient light gestures and heart rate monitoring), as well as relative humidity (RH) / temperature sensors and Hall effect magnetic sensors. These devices leverage our mixed-signal capability to provide high accuracy, process technology to improve performance and lower power consumption than competing parts.

Infrastructure Products

Timing Devices
Robust demand for bandwidth is driving the deployment of next-generation Internet infrastructure equipment to deliver higher speed, higher capacity and more flexible networks. This transition puts unique requirements on the clocks and oscillators used to provide timing and synchronization for the equipment responsible for switching, transporting, processing and storing network traffic. To meet this need, we provide low-jitter, frequency-flexible, mass-customizable timing solutions that accelerate development time, minimize cost and improve system reliability. Our high-performance "clock-tree-on-a-chip" products offer highly integrated single-chip IC solutions for clock synthesis and jitter attenuation, offering superior jitter performance and frequency flexibility for high data rate applications.

Electronic test and measurement equipment

White goods

Remote controls

Consumer health & fitness (wearables)

Smart home sensing

Industrial controls

Toys and consumer electronics

Monitors and lavatory controls

Consumer medical

Optical networking

Telecommunications

Data communications

Switches/routers

Industrial

Servers and storage

Mobile fronthaul and backhaul

Wireless base stations

Small cells

Broadcast video

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Product Areas and Description	Applications
Isolation Products Our digital isolation techniques enable customers to deploy more energy efficient power solutions that meet isolation safety standards and solve difficult electronic noise issues. Systems such as data center servers, cellular base stations, uninterruptable power supplies and electric vehicles require increasingly energy efficient power solutions. Electric motors used in electric vehicles, pumps, HVAC compressors, fans and automated machinery need more sophisticated and efficient digital controls. Our isolation technology enables customers to address these demanding requirements. Products include multi-channel isolators, isolated drivers, isolated power converters and mixed-signal devices that simplify design, improve reliability, minimize noise emissions and reduce system cost	Industrial control and automation systems Cloud, datacenter and telecom power supplies Electric vehicle charging stations Solar inverters Hybrid / Electric automotive drive trains Motor control High power audio Test and measurement equipment
Broadcast Products *Broadcast Consumer* Our single-chip hybrid TV tuners and analog TV demodulators leverage our proven digital low-IF architecture and exceed the performance of traditional discrete TV tuners, enabling TV makers worldwide to deliver improved picture quality and better reception for both analog and digital broadcasts. Our small, low-power and high-performance single and dual digital video demodulators support DVB-T/T2, DVB-S/S2/S2X, DVB-C/C2, and/or ISDB-T in a single chip and are ideal for equipment receiving digital terrestrial, satellite and/or cable services. Our AM/FM, HD Radio and DAB/DAB+ receivers deliver a complete radio solution from antenna input to audio output in a single chip. The broadcast audio products are based on an innovative digital architecture that enables significant improvements in performance, which translates to a better consumer experience, while reducing system cost and board space for our customers.	Integrated digital televisions (iDTV) Free-to-Air (FtA) or pay-TV set-top boxes

PVR/DVD/Blu-Ray/HDD video recorders

PC-TV applications

AM/FM clock radios

DAB digital radios

HD Radio digital radios

Home theater systems

Portable audio devices

MP3/digital media players

Broadcast Automotive
Our high-performance solutions for car audio systems include high-fidelity radio ICs that improve the end user experience, reduce system cost and offer the latest digital radio technologies like DAB/DAB+ and HD Radio. Our scalable architecture enables infotainment system suppliers to leverage their investments across multiple product lines ranging from entry-level car radios to cutting-edge multi-tuner, multi-antenna radios for premium vehicles.

Automotive OEM infotainment systems

Aftermarket car radios

Navigation/GPS devices

Access Products

ProSLIC® Subscriber Line Interface Circuits for VoIP
Our ProSLIC provides the analog subscriber line interface on the source end of the telephone which generates dial tone, busy tone, caller ID and ring signal. Our offerings are well suited for the market for Voice over IP telephony applications deployed over cable,

DSL, optical and wireless fixed terminal networks.

Voice functionality for cable, DSL and optical digital modems and terminal adapters

VoIP residential gateways

Wireless local loop remote access systems

PBXs

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Product Areas and Description	Applications
ISOmodem® Embedded Modems Our ISOmodem embedded modems leverage innovative silicon direct access arrangement (DAA) technology and a digital signal processor (DSP) to deliver a globally compliant, compact analog modem for embedded applications.	Fax machines and multi-function printers
	Point of sale (POS) terminals
	Security systems
	Industrial monitoring
	Remote medical monitoring
Power over Ethernet Our PoE power source equipment and powered device ICs offer highly differentiated solutions with a reduced total bill of materials (BOM) and improved performance and reliability. Our solutions offer a higher level of integration not available with competing solutions.	Enterprise networking routers and switches
	Wireless access points (WAP)
	VoIP phones
	POS terminals
	Security cameras

Revenues during fiscal 2018, 2017 and 2016 were generated predominately by sales of our mixed-signal products. The following summarizes our revenue by product category (in thousands):

	Fiscal Year

	2018	2017	2016
Internet of Things	$ 463,838	$ 395,012	$ 314,614
Infrastructure	199,478	152,158	147,677
Broadcast	141,412	152,980	157,746
Access	63,539	68,717	77,589
Revenues	$ 868,267	$ 768,867	$ 697,626

Customers, Sales and Marketing

We market our products through our direct sales force and through a network of independent sales representatives and distributors. Direct and distributor customers buy on an individual purchase order basis, rather than pursuant to long-term agreements.

We consider our customer to be the end customer purchasing either directly from a distributor, a contract manufacturer or us. During fiscal 2018, our ten largest end customers accounted for 20% of our revenues. We had no customer that represented more than 10% of our revenues during this period. An end customer purchasing through a contract manufacturer typically instructs such contract manufacturer to obtain our products and incorporate such products with other components for sale by such contract manufacturer to the end customer. Although we sell the products to, and are paid by distributors and contract manufacturers, we refer to such end customer as our customer. Two of our distributors who sell directly to our customers, Arrow Electronics and Edom Technology, each represented 21% and 17% of our revenues during fiscal 2018, respectively. There were no contract manufacturers that accounted for 10% or more of revenues for fiscal 2018. During fiscal 2018, we consolidated our distribution relationships to a single global distributor, Arrow Electronics. We are maintaining our extensive network of regional distributor partners and etailers to complement our single global distributor partner.

We maintain numerous sales offices in Asia, the Americas and Europe. Revenue is attributed to a geographic area based on the shipped-to location. The percentage of our revenues derived from outside of the United States was 83% in fiscal 2018. For further information regarding our revenues and long-lived assets by geographic area, see Note 18, *Segment Information*, to the Consolidated Financial Statements.

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Our direct sales force is comprised of many sales professionals who possess varied levels of responsibility and experience, including directors, country managers, regional sales managers, district sales managers, strategic account managers, field sales engineers and sales representatives. We also utilize independent sales representatives and distributors to generate sales of our products. We have relationships with many independent sales representatives and distributors worldwide whom we have selected based on their understanding of the mixed-signal marketplace and their ability to provide effective field sales applications support for our products.

Our marketing efforts are targeted at both identified industry leaders and emerging market participants. Direct marketing activities are supplemented by a focused marketing communications effort that seeks to raise awareness of our company and products. Our public relations efforts are focused on leading trade and business publications. Our external website is used to deliver corporate and product information. We also pursue targeted advertising in key trade publications and we have a cooperative marketing program that allows our distributors and representatives to promote our products to their local markets in conjunction with their own advertising activities. Finally, we maintain a presence at strategic trade shows and industry events. These activities, in combination with direct sales activities, help drive demand for our products.

Due to the complex and innovative nature of our products, we employ experienced applications engineers who work closely with customers and distributors to support the design-win process, and can significantly accelerate the customer's time to market. A design win occurs when a customer has designed our ICs into its product architecture and ordered product from us. A considerable amount of effort to help a customer incorporate our ICs into its products is typically required prior to any sale. In many cases, our innovative ICs require significantly different implementations than existing approaches and, therefore, successful implementations may require extensive communication with potential customers. The amount of time required to achieve a design win can vary substantially depending on a customer's development cycle, which can be relatively short (such as three months) or very long (such as two years) based on a wide variety of customer factors. Not all design wins ultimately result in revenue, or may result in less revenue than expected. However, once a completed design architecture has been implemented and produced in high volumes, our customers are reluctant to significantly alter their designs due to this extensive design-win process. We believe this process, coupled with our intellectual property protection, promotes relatively longer product life cycles for our products and high barriers to entry for competitive products, even if such competing products are offered at lower prices. Our close collaboration with our customers provides us with knowledge of derivative product ideas or completely new product line offerings that may not otherwise arise in other new product discussions.

Research and Development

Through our research and development efforts, we leverage experienced analog and mixed-signal engineering talent and expertise to create new ICs that integrate functions typically performed less efficiently by multiple discrete components. This integration generally results in lower costs, smaller die sizes, lower power demands and enhanced price/performance characteristics. We attempt to reuse successful techniques for integration in new applications where similar benefits can be realized. We believe that we have attracted many of the best engineers in our industry. We believe that reliable and precise analog and mixed-signal ICs can only be developed by teams of engineers who have significant analog experience and are familiar with the intricacies of designing these ICs for commercial volume production. The development of test methodologies is just one example of a critical activity requiring experience and know-how to enable the rapid release of a new product for commercial success. We have accumulated a vast set of trade secrets that allow us to pursue innovative approaches to mixed-signal problems that are difficult for competitors to duplicate. We highly value our engineering talent and strive to maintain a very high bar when bringing new recruits to the company.

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Research and development expenses were $238.3 million, $209.5 million and $199.7 million in fiscal 2018, 2017 and 2016, respectively.

Technology

Our product development process facilitates the design of highly-innovative, analog-intensive, mixed-signal ICs. Our engineers' deep knowledge of existing and emerging standards and performance requirements helps us to assess the technical feasibility of a particular IC. We target areas where we can provide compelling product improvements. Once we have solved the primary challenges, our field application engineers continue to work closely with our customers' design teams to maintain and develop an understanding of our customers' needs, allowing us to formulate derivative products and refined features.

In providing mixed-signal ICs for our customers, we believe our key competitive advantages are:

Analog and RF design expertise in CMOS;

Mixed-signal, firmware and system design expertise;

Microcontroller and system on a chip design expertise;

Software expertise, including multiprotocol connectivity and real-time operating systems for the IoT;

Module integration and wireless design expertise; and

Our broad understanding of systems technology and trends.

To fully capitalize on these advantages, we have assembled a world-class development team with exceptional analog and mixed-signal design expertise led by accomplished senior engineers.

Analog and RF Design Expertise in CMOS

We believe that our most significant core competency is world-class analog and RF design capability. Additionally, we strive to design substantially all our ICs in standard CMOS processes. Most of our product designs now incorporate some type of RF in CMOS technology. While it is often significantly more difficult to design analog ICs in CMOS, CMOS provides multiple benefits versus existing alternatives, including significantly reduced cost, reduced technology risk and greater worldwide foundry capacity. CMOS is the most commonly used process technology for manufacturing digital ICs and as a result is most likely to be used for the manufacturing of ICs with finer line geometries. These finer line geometries can enable smaller and faster ICs. By designing our ICs in CMOS, we enable our products to benefit from this trend towards finer line geometries, which allows us to integrate more digital functionality into our mixed-signal ICs.

Designing analog and mixed-signal ICs is significantly more complicated than designing standalone digital ICs. While advanced software tools exist to help automate digital IC design, there are far fewer tools for advanced analog and mixed-signal IC design. In many cases, our analog circuit design efforts begin at the fundamental transistor level. We believe that we have a demonstrated ability to design the most difficult analog and RF circuits using standard CMOS technologies.

Mixed-Signal, Firmware and System Design Expertise

We consider the partitioning of a circuit to be a proprietary and creative design technique. Deep systems knowledge allows us to use our mixed-signal and RF in CMOS design expertise to maximize the price/performance characteristics of both the analog and digital functions and allow our ICs to work in an optimized manner to accomplish particular tasks. Generally, we attempt to move analog functions into the digital domain as quickly as possible, creating system efficiencies without compromising

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performance. These patented approaches require our advanced signal processing and systems expertise. We then leverage our firmware know-how to change the 'personality' of our devices, optimizing features and functions needed by various markets we serve. For example, our wireless SoC devices for IoT applications integrate both digital and analog domains in a single chip. The SoCs combine ARM Cortex-M processor cores, a variety of digital and analog peripherals, hardware cryptography accelerators, and analog-intensive multiprotocol radio transceivers. This system integration at the chip level leverages our deep expertise in mixed-signal and RF design, and low-power wireless MCU architectures pioneered for more than a decade.

Microcontroller and System on a Chip Design Expertise

We have the talent and circuit integration methodologies required to combine precision analog, high-speed digital, flash memory and in-system programmability into a single, monolithic CMOS integrated circuit. Our microcontroller products are designed to capture an external analog signal, convert it to a digital signal, compute digital functions on the stream of data and then communicate the results through a standard digital interface. The ability to develop standard products with the broadest possible customer application base while being cost efficient with the silicon area of the monolithic CMOS integrated circuit requires a keen sense of customer value and engineering capabilities. Additionally, to manage the wide variety of signals on a monolithic piece of silicon including electrical noise, harmonics and other electronic distortions requires a fundamental knowledge of device physics and accumulated design expertise.

Software Expertise

Our software expertise allows us to develop products for markets where intelligent data capture, high-performance processing and communication are increasingly important product differentiators. The software we have developed to address these markets enables machine-to-machine communications, providing intelligence to electronic systems. Our products integrate high-performance, low-power wireless and microcontroller ICs with reliable and scalable software into a flexible and robust networking platform.

The demand for low-power, small-footprint wireless technology is accelerating as more and more IP-enabled end points are being connected to the IoT. Our software enables a broad range of power-sensitive applications for the IoT, including smart energy, home automation, security and other connected products. We believe that the combination of our software and IC design expertise differentiates us from many of our competitors.

As the IoT continues to mature, a new class of embedded applications is emerging, presenting feature-rich and task-intensive use cases. This growing complexity is driving the need for real-time operating systems to help simplify software development for IoT applications by coordinating and prioritizing multiprotocol connectivity, SoC peripherals and other system-level activities. In addition to being able to manage numerous application tasks, an RTOS enhances scalability, and makes complex applications predictable and reliable. To address these application needs, we acquired Micrium, an embedded RTOS provider. Micrium has established itself as a reliable, high performance and trusted RTOS software platform, with an installed base that has grown to millions of devices.

Module Integration and Wireless Design Expertise

The market for wireless modules has grown as customers search for solutions that provide turnkey wireless connectivity to their products. The development of modules is difficult due to stringent requirements, including high levels of integration, programmability, performance, reliability, security and power efficiency. In addition, designs must meet numerous wireless standards deployed in various environments and serving diverse requirements.

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Our combined expertise in IC design and software development allows us to engineer modules that provide robust, high-performance connections in challenging wireless environments. We have developed wireless modules based on numerous wireless standards, including Z-Wave, Bluetooth, Zigbee, Thread, Wi-Fi and sub-GHz. We believe our demonstrated proficiency in the design of modules provides our customers with significant advantages such as fast time to market, reduced development cost, global wireless certifications and software reuse.

Understanding of Systems Technology and Trends

Our focused expertise in mixed-signal ICs is the result of the breadth of engineering talent we have assembled with experience working in analog-intensive CMOS design for a wide variety of applications. This expertise, which we consider a competitive advantage, is the foundation of our in-depth understanding of the technology and trends that impact electronic systems and markets. Our expertise includes:

Isolation, which is critical for existing and emerging industrial applications and telecom networks;

Frequency synthesis, which is core technology for wireless and clocking applications;

Integration, which enables the elimination of discrete components in a system; and

Signal processing and precision analog, which forms the heart of consumer, industrial, medical and automotive electronics applications.

Our understanding of the role of analog/digital interfaces within electronic systems, standards evolution, and end market drivers enables us to identify product development opportunities and capitalize on market trends.

Manufacturing

As a fabless semiconductor company, we conduct IC design and development in our facilities and electronically transfer our proprietary IC designs to third-party semiconductor fabricators who process silicon wafers to produce the ICs that we design. Our IC designs typically use industry-standard CMOS manufacturing process technology to achieve a level of performance normally associated with more expensive special-purpose IC fabrication technology. We believe the use of CMOS technology facilitates the rapid production of our ICs within a lower cost framework. Our IC production employs submicron process geometries which are readily available from leading foundry suppliers worldwide, thus increasing the likelihood that manufacturing capacity will be available throughout our products' life cycles. We currently partner with Taiwan Semiconductor Manufacturing Co. (TSMC) and Semiconductor Manufacturing International Corporation (SMIC) to manufacture the major