

GSI TECHNOLOGY INC  
Form 10-K  
June 10, 2016  
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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 March 31, 2016

or

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

For the transition period from            to

Commission File Number 001-33387

GSI Technology, Inc.

(Exact name of registrant as specified in its charter)

Delaware	77-0398779
(State or other jurisdiction of incorporation or organization)	(IRS Employer Identification No.)

1213 Elko Drive

Sunnyvale, California 94089

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(Address of principal executive offices, zip code)

(408) 331-8800

(Registrant's telephone number, including area code)

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

Title of Each Class

Common Stock, \$0.001 par value

Name of Each Exchange on which Registered

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. Yes  No

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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes  No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of 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.

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

Large accelerated filer  Accelerated filer  Non-accelerated filer  Smaller reporting company

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

The aggregate market value of the registrant's voting stock held by non-affiliates of the registrant, based upon the closing sale price of the common stock on September 30, 2015, as reported on the Nasdaq Global Market, was approximately \$63.7 million. Shares of the registrant's common stock held by each officer and director and each person who owns 10% or more of the outstanding common stock of the registrant have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes. As of May 31, 2016, there were 21,208,548 shares of the registrant's common stock issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement for its 2016 annual meeting of stockholders are incorporated by reference into Part III hereof.

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GSI TECHNOLOGY, INC.

2016 FORM 10-K ANNUAL REPORT

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### Forward-looking Statements

In addition to historical information, this Annual Report on Form 10-K includes 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 (the "Exchange Act"). These forward-looking statements involve risks and uncertainties. Forward-looking statements are identified by words such as "anticipates," "believes," "expects," "intends," "may," "will," and other similar expressions. In addition, any statements which refer to expectations, projections, or other characterizations of future events or circumstances are forward-looking statements. Actual results could differ materially from those projected in the forward-looking statements as a result of a number of factors, including those set forth in this report under "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Risk Factors," those described elsewhere in this report, and those described in our other reports filed with the Securities and Exchange Commission ("SEC"). We caution you not to place undue reliance on these forward-looking statements, which speak only as of the date of this report, and we undertake no obligation to update these forward-looking statements after the filing of this report. You are urged to review carefully and consider our various disclosures in this report and in our other reports publicly disclosed or filed with the SEC that attempt to advise you of the risks and factors that may affect our business.

## PART I

### Item 1. Business

#### Overview

For many years we have developed and marketed high performance memory products, including "Very Fast" static random access memory, or SRAM, and low latency dynamic random access memory, or LLDRAM, that are incorporated primarily in high-performance networking and telecommunications equipment, such as routers, switches, wide area network infrastructure equipment, wireless base stations and network access equipment. We sell these products to leading original equipment manufacturer, or OEM, customers including Alcatel-Lucent, Cisco Systems and Huawei Technologies. In addition, we serve the ongoing needs of the military, industrial, test and measurement equipment, automotive and medical markets for high-performance SRAMs. Based on the performance characteristics of our products and the breadth of our product portfolio, we consider ourselves to be a leading provider of Very Fast SRAMs. We utilize a fabless business model, which allows us both to focus our resources on research and development, product design and marketing, and to gain access to advanced process technologies with only modest capital investment and fixed costs.

Subsequent to our acquisition of MikaMonu Group Ltd. ("MikaMonu"), discussed below, we have expanded our strategy to include the development of in-place associative computing solutions for applications in evolving new markets such as "big data" (including machine learning and deep convolutional neural networks ("CNNs")), computer vision, and cyber security.

We were incorporated in California in 1995 under the name Giga Semiconductor, Inc. We changed our name to GSI Technology in December 2003 and reincorporated in Delaware in June 2004 under the name GSI Technology, Inc. Our principal executive offices are located at 1213 Elko Drive, Sunnyvale, California, 94089, and our telephone number is (408) 331-8800.

#### Recent Developments

#### Recent Acquisition

On November 23, 2015, we acquired all of the outstanding capital stock of privately held MikaMonu, a development-stage, Israel-based company that specializes in in-place associative computing for markets including

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big data, computer vision and cyber security. MikaMonu, located in Tel Aviv, held 12 United States patents and a number of pending patent applications.

With the vast amount of data currently being generated, and the increasing demand for faster processing of that data, memory bus speeds are not keeping up with processor speeds. MikaMonu's in-place associative computing technology addresses this issue by changing the concept of computing from serial data processing – where data is moved back and forth from the processor to the memory – to parallel data processing, computation and search directly in the main processing array. This new computing model has the potential to greatly expedite computation and response times in “big data” applications. Fast response times are also needed in the computer vision and cyber security markets. For example, in the automotive market, advanced driver assistance systems (ADAS) require a tremendous amount of image processing to be accomplished in real-time. MikaMonu's massively parallel computing technology is well suited to address these needs. We believe that our state-of-the-art circuit design expertise will enable the development of high quality associative processors incorporating MikaMonu's patented, in-place associative computing technology and algorithms, potentially creating a new category of computing products with substantial target markets and a large new customer base in those markets. Realization of the potential synergies of the acquisition, however, will require a substantial development effort over more than a year, with initial products not expected to be introduced until late calendar 2017.

The acquisition has been accounted for as a purchase under authoritative guidance for business combinations. The purchase price of the acquisition has been preliminarily allocated to the intangible assets acquired, with the excess of the purchase price over the fair value of assets acquired recorded as goodwill. The results of operations of MikaMonu and the estimated fair value of the assets acquired were included in our consolidated financial statements beginning November 23, 2015.

Under the terms of the acquisition agreement, we paid the former MikaMonu shareholders initial cash consideration of approximately \$4.4 million at the closing on November 23, 2015. We will make cash payments of up to \$484,000 to the three former MikaMonu shareholders in May 2017 upon the release of cash held in escrow for potential indemnification claims. Additionally, we will make cash retention payments of up to an additional \$2.5 million to the three former MikaMonu shareholders in installments over a four-year period, conditioned on the continued employment of Dr. Avidan Akerib, MikaMonu's co-founder and chief technologist. We will also make “earnout” payments to the former MikaMonu shareholders in cash or shares of our common stock, at our discretion, during a period of up to ten years following the closing if certain product development milestones and revenue targets for products based on the MikaMonu technology are achieved. Earnout amounts of \$750,000 will be payable if certain product development milestones are achieved by December 31, 2017. Additional earnout amounts of \$2,750,000 and \$4,000,000 will be payable if certain revenue milestones are achieved by January 1, 2021 and January 1, 2022, respectively; and additional payments, up to a maximum of \$30 million, equal to 5% of net revenues from the sale of qualifying products in excess of certain thresholds, will be made quarterly through December 31, 2025.

### Settlement of Protracted Litigation with Cypress Semiconductor Corporation

On May 6, 2015, we entered into a settlement agreement with Cypress Semiconductor Corporation to resolve a lawsuit filed by Cypress in the United States District Court for the Northern District of California alleging that certain of our products infringe patents held by Cypress and a separate lawsuit pending in the same court in which we had alleged that Cypress violated federal and state antitrust laws. Reference is made to “Item 3. Legal Proceedings” for information regarding this protracted litigation that began in 2011. Under the settlement agreement:

- Each of the parties agreed to dismiss its lawsuit in consideration of the dismissal of the lawsuit brought by the other party; and



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· Each party released all claims against the other with respect to issues raised in the two lawsuits. The parties agreed that the settlement agreement was entered into to resolve disputed claims, and that each party denies any liability to the other party.

## Industry Background

### SRAM, LLDRAM and Bandwidth Engine Market Overview

Virtually all types of high-performance electronic systems incorporate some form of volatile memory. An SRAM is a memory device that retains data as long as power is supplied, without requiring any further user intervention. In contrast, dynamic random access memory, or DRAM, is a memory device that requires user intervention in the form of refresh operations to retain data while power is supplied, due to the capacitive nature of its memory cell. However, a DRAM memory cell is much smaller than an SRAM memory cell, so several times more DRAM bits than SRAM bits can be implemented in any given unit area of silicon. The fundamentally different characteristics of SRAM and DRAM memory cells have resulted in the emergence of markedly different architectures for SRAM-based and DRAM-based memory products, and the two types of memory serve different applications. Classically, SRAM-based products have served high performance requirements while DRAM-based products have been used in cost-optimized applications. Today, SRAM- and DRAM-based products serve both performance and cost-based applications. As the volatile memory market fragments into a variety of specialized products, more meaningful distinctions between volatile memory products can be made.

There is an increasingly broad variety of volatile memory products on the market, characterized by a number of attributes, such as speed, memory capacity, or density, I/O interface and power consumption. There are several different industry measures of speed:

- latency, which is the delay between the request for data and the delivery of such data for use and is measured in nanoseconds, or ns, or when used to describe performance of synchronous memory products may be described in terms of numbers of clock cycles required between the load of an address and the delivery of valid data;
- random access time, which is the minimum amount of time required between accesses to random locations within the memory array, typically measured in nanoseconds, or ns;
- bandwidth, which is the rate at which data can be streamed to or from a device and is often measured in megabits or gigabits per second (Mb/s or Gb/s);
- clock frequency, which is the cycle rate of a clock within a synchronous device and is often measured in megahertz or gigahertz (MHz or GHz); and
- transaction rate, which is the rate at which new commands can be executed by the memory device, and is often measured in millions or billions of transactions per second (MT/s or BT/s).

Historically, SRAMs have been utilized wherever other lower price-per-bit memory technologies have been inadequate. SRAMs demonstrate lower latency and faster random access times relative to DRAMs and other types of memory technologies, but at a higher price-per-bit. Historically, the volatile memory market has had three price-performance points, DRAM at the low end, Fast SRAM at the high end, and slow SRAM in the middle. Over the past two decades, alternative memory technologies have been introduced to address certain applications that formerly used slow SRAMs. For example, new types of DRAM have displaced slow SRAM in applications such as cell phones. However, in the networking memory market a technology vacuum formed between Fast SRAMs on one end and commodity DRAMs at the other, with no high bandwidth, high transaction rate, moderate capacity,

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moderate latency, and moderate cost volatile memory product to fill the void. In the past decade, low latency DRAMs, or LLDRAMs, have been developed to fill that void. Like the slow SRAMs that came before them, LLDRAMs have a much higher price-per-bit than commodity DRAMs (in order to deliver higher transaction rates) but demonstrate slower random access times and longer latencies than Fast SRAMs.

All of these SRAM and DRAM technologies utilize traditional parallel I/O interfaces that require a significant number of pins. Recently we have partnered with another company to provide a new serial I/O (SerDes) memory device called "Bandwidth Engine" which is fabricated using embedded DRAM technology. The Bandwidth Engine has capacity comparable to LLDRAMs but offers far greater transaction rate and data bandwidth capability (greater even than Fast SRAMs) through its serial interface. It can also execute a variety of read-modify-write operations previously unavailable in any other memory device. The networking market is just beginning to take advantage of the unique and powerful capabilities of Bandwidth Engine technology.

The need for increasingly greater capacity, data bandwidth and transaction rates from the various memory technologies continues unabated as the networking market begins to make preparations for Terabit networking in the latter half of the current decade. We believe that Fast SRAM, LLDRAM and Bandwidth Engine products, optimized for networking applications, will play an increasingly essential role in enabling continued improvements in network performance.

As a result of the displacement of low performance SRAMs, the total market size for SRAMs is diminishing. However, due to their inherent higher latency characteristics, DRAMs cannot match the random access speed of high-performance SRAMs. Gartner Dataquest divides the SRAM market into segments based on speed. The highest performance segment is comprised of SRAMs that operate at speeds of less than 10 nanoseconds, which we refer to as "Very Fast SRAMs." Very Fast SRAMs are predominantly utilized in high-performance networking and telecommunications equipment.

### Increasing Need for Networking Memory Products

Growth in data, voice and video traffic has driven the need for both greater networking bandwidth and more complex routing and switching equipment, resulting in the continued expansion of the networking and telecommunications infrastructure. The continued growth in the level of Internet usage has led to the proliferation of a wide variety of equipment throughout the networking and telecommunications infrastructure, including routers, switches, wireless local area network infrastructure equipment, wireless base stations and network access equipment, and a continuing demand for new equipment with faster and higher performance. Moving data in and out of high performance volatile memory is the core task of every piece of networking equipment. The access patterns or workload of most memory arrays used in networking equipment are significantly different from those of memory devices typically used in the computer market, such as the DRAMs used for main storage in PCs. As a result, distinct classes of memory products optimized for the demands of the networking market have been emerging over the last fifteen years. The sharply rising demand for increasing worldwide network performance is expected to drive a continuing need for ever more specialized memory products. High-performance networking and telecommunications equipment requires a variety of memory types; both SRAM-based and DRAM-based. Some of the required memory arrays are embedded in specialized processors or ASICs but many tasks require more bits than can be accommodated on a processor or ASIC, and must be provided in some form of external volatile memory. SRAM-based and DRAM-based networking memory products address this requirement. For example, in a typical router or switch, multiple networking-optimized memory devices are required to temporarily store, or buffer, data traffic and to provide rapid lookup of information in data tables. As networking equipment must increasingly support advanced traffic content such as Voice over Internet Protocol, or VoIP, video streaming and bi-directional video, demand for even higher performance networking memory is expected to continue to increase.



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### Demanding Requirements for Success in the Networking Memory Market

The pressure on networking and telecommunications OEMs to bring higher performance equipment to market rapidly to support not only more traffic but also more advanced traffic content is compounded by the requirement that this new equipment occupy no more space than the equipment it replaces, which results in increased circuit density requirements and the need for lower power operations. In response to these pressures, OEMs have increasingly relied on providers that are capable of rapidly developing and introducing advanced, higher density, low power networking memory. The variety of memory applications within the networking and telecommunications markets has also driven a need for more specialized products available in relatively low volumes. These specialized products include high-speed synchronous memory products implemented in both SRAM and DRAM memory technologies with a range of density, latency and bandwidth capabilities. In general, OEMs prefer to work with a supplier who can address the full range of their high-performance networking memory product requirements and, just as importantly, can offer the technical and logistic support necessary to sustain and accelerate their efforts.

We believe the key success factors for a networking memory vendor are the ability to offer a broad catalog of high-performance, high-quality and high-reliability networking memory products, to continuously introduce new products with higher speeds, lower power and greater densities, to maintain timely availability of prior generations of products for several years after their introductions, and to provide effective logistic and technical support throughout their OEM customers' product development and manufacturing life cycles.

### The GSI Solution

We endeavor to address the overall needs of our OEM customers, not only satisfying their immediate requirements for our latest generation, highest performance networking memory, but also providing them with the ongoing long-term support necessary during the entire lives of the systems in which our products are utilized. Accordingly, the key elements of our solution include:

#### Innovative Product Performance Leadership

**High Speed.** Through the use of advanced architectures, design methodologies and silicon process technologies, we have developed a wide variety of high-performance networking memory products. Our SRAM product line has evolved from BurstRAMs with an average transaction rate of about 0.125 BT/s to our SigmaQuad™-IVe SRAMs with transaction rates up to 2.66 BT/s and data bandwidths of up to 192 Gb/s, greater than any other SRAM commercially available today. Our current Low Latency DRAMs deliver transaction rates of up to 0.533 BT/s and data bandwidths of up to 38 Gb/s. Our Bandwidth Engine products provide transaction rates exceeding 4 BT/s and data bandwidths of up to 400 Gb/s. Our SRAM products can produce data at latencies of 4 to 5 ns while LLDRAM and Bandwidth Engine latencies are approximately 15 ns. By providing higher performance networking memory, we enable our networking and telecommunications customers to continually design and develop higher performance products that support increasingly complex traffic content.

**Low Power Consumption.** Many of our products require significantly less power than comparable products offered by our principal competitors. Because these products utilize less power and generate less heat, the reliability of the networking or telecommunications equipment in which they are employed increases. Furthermore, the low power utilization of our products helps enable OEMs to add capabilities to their systems, which otherwise might not have been possible due to overall system power constraints.

**Process Technology Leadership.** We maintain our own process engineering capability and resources, which are located in close physical proximity to our SRAM wafer manufacturing partner, Taiwan Semiconductor Manufacturing Company, or TSMC. This enhances our ability to work closely with TSMC to develop modifications of the advanced

process technologies used in the manufacturing of our Fast SRAMs in order to maximize product

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performance, optimize yields, lower manufacturing costs and improve quality. Our most advanced 144 and 288 Mb synchronous Very Fast SRAMs are manufactured using 40 nanometer process technology. Our LLDRAMs are being produced using 63 nanometer DRAM process technology at Powerchip Technology Corporation, or Powerchip, in Taiwan.

**Product Innovation.** We believe that we have established a position as a technology leader in the design and development of Very Fast SRAMs. We were the first supplier to introduce 72-bit-wide SRAMs as single monolithic ICs. In 2010, we were the first supplier to introduce a Fast Synchronous SRAM capable of one billion transactions per second – SigmaQuad-IIIe – whose 1.45 BT/s capability was more than double any other SRAM commercially available at the time. In early 2015, we further solidified our position as a technology leader by being the first vendor to introduce and ship 288 megabit monolithic SRAMs. In addition, we are the only vendor to offer a full line of Very Fast Synchronous SRAMs that operate and interface at 1.8 to 3.3 volts, giving our OEM customers the ability to use the same product in systems that operate at any voltage within that range. Moreover, we are the only vendor to offer a Very Fast Synchronous SRAM product that operates at 1.8 volts and uses approximately one-half to two-thirds the power of our competitors' 2.5 volt products.

### Broad and Readily Available Product Portfolio

**Extensive Product Catalog.** The Very Fast SRAM market is highly fragmented in terms of product features and specifications. This is especially true of the networking segment of the fast SRAM market and is becoming true of the LLDRAM segment as well. To meet our OEM customers' diverse needs, we have what we believe is the broadest catalog of Very Fast SRAM products currently available, and our LLDRAM and Bandwidth Engine product lines further expand our position in the networking market. Our product line includes a wide range of devices with varying densities, features, clock speeds, and voltages, as well as several operating temperature ranges and numerous package options in both 5/6 RoHS (lead) and 6/6 RoHS (lead-free) versions, which are compliant with the European Union's Restriction on the Use of Hazardous Substances Directive 2002/95/EC.

**Advanced Feature Sets.** Our products offer features that address a broad range of our networking and telecommunications OEMs' system requirements. Among these features is a JTAG test port, named for the IEEE Joint Test Action Group, which enables post-assembly verification of the connection between our product and an OEM customer's system board, thereby allowing an OEM customer of ours to develop, test and ship their products more rapidly. Additionally, we offer our FLXDrive™ feature, which allows system designers to optimize the signal integrity for any given requirement. We also provide OEMs the ability to employ certain of our products in various modes of operation by using our products' mode control pins, thus increasing the flexibility of those products and their ready availability from our inventory.

**Superior Lifetime Availability of Products.** Unlike the market for consumer electronics, the markets in which we compete, particularly the networking and telecommunications markets, generally are characterized by system designs that remain in production for extended periods of time, and maintenance of those systems in the field for even longer periods is critical to their success. Our foundry-based manufacturing strategy, our process technology selections, our master-die design strategy and the design of our packaging, burn-in and test work-flows all contribute to allow us to meet and exceed our guarantee of providing a product life of at least seven years for any new product family we bring to market. These techniques also allow us to keep our delivery lead-times relatively short even for specialized, infrequently ordered members of those product families. We believe our approach is better suited to address the needs of our target markets than attempts to apply mass market manufacturing strategies to networking memory products.

**Multiple Temperature Grades.** We offer both commercial and industrial temperature grades for all of our products. This ability to perform at specification throughout the industrial temperature range of -40°C to +85°C is critical for memory products used in a broad variety of networking and telecommunications applications, where the





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operating environments may be harsh. We now also offer a portfolio of off-the-shelf military temperature SRAM products and can also offer military customers additional and extended temperature grades upon request.

### Master Die Methodology

Our master die methodology enables multiple product families, and variations thereof, to be manufactured from a single mask set. As a result, based upon the way available die from a wafer are metalized, wire bonded, packaged and tested, from 25 mask sets we have created over 15,000 different products. Using these mask sets, we produce wafers that can be further processed upon customer orders into the final specified product thereby significantly shortening the overall manufacturing time. For example, from a 72 megabit mask set, we can produce three families of 72 megabit SRAM products. Our unique methodology results in the following benefits:

**Rapid Order Fulfillment.** We maintain a common pool of wafers that incorporate all available master die. Because we can typically create several different products from a single master die, we can respond to unforecasted customer orders more quickly than our competitors.

**Reduced Cost.** Our master die methodology allows us to reduce our costs through the purchase of fewer mask sets by allowing faster and less expensive internal product qualifications, by enabling more cost-efficient use of engineering resources and by reducing the incidence of obsolete inventory.

### Customer Responsiveness

**Customer-driven Solutions.** We work closely with leading networking and telecommunications OEMs, as well as their chip-set suppliers, to better anticipate their requirements and to rapidly develop and implement solutions that allow them to meet their specific product performance objectives. Customer demand drives our business. For example, to address near term needs, we offer critical specification variations, such as special operating ranges or wire bond options on currently available products, while we also design new families of products to meet their emerging long term needs. As a consequence, our portfolio not only includes the widest selection of catalog parts available, it also includes an extensive list of custom, customer-specific products. This degree of responsiveness enables us to provide our OEM customers with the exact products required for their applications.

**Preemptive Service.** Our extensive open libraries of design support tools as well as our ability to deliver the specific device required for system prototyping with very short notice enables networking and telecommunication OEMs to design and introduce differentiated products quickly as well as to reduce their development costs. Our open model libraries give designers access 24 hours a day, seven days a week to electrical and behavioral simulation models. Behavioral models are offered in both Verilog and very high speed integrated circuits hardware description language ("VHDL") format to better fit different customers' simulation environments, further streamlining the customers' development process. We currently offer our FPGA controller IP free of charge for use with our Type II+ and Type IIIe SigmaQuad and SigmaDDR Fast SRAM devices to help enable our customers to design FPGA-based systems quickly and efficiently, and reach the market with their products faster, and are also developing new FPGA controller IP for use with our next generation Type IVe SigmaQuad and SigmaDDR SRAMs, as well as for our next generation LLDRAMs. Controller IP is also available for our Bandwidth Engine products. Our open model libraries and support tools, coupled with the FPGA controller IP, can save our customers months of design effort and leverage the extensive evaluation and timing already performed by our engineers to enhance their products' performance, reduce development costs and shorten time-to-market. We refer to this customer support as "Preemptive Service."

**Quality and Reliability.** Networking and telecommunications equipment typically have long product lives, and the cost to repair or replace this equipment due to product failure at any time is prohibitively expensive. The



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high-quality and reliability of memory products incorporated in our OEM customers' products is, thus, critical. Every product family we offer is subjected to extensive long term reliability testing before receiving qualification certification, and every device shipped is first subjected to burn-in and then to final tests in which the device is operated beyond its specified operating voltage and temperature ranges.

### The GSI Strategy

Our objective is to profitably increase our market share in the high performance memory market. Our strategy includes the following key elements:

**Continue to Focus on the Networking and Telecommunications Markets.** We intend to continue to focus on designing and developing high transaction rate, low latency, high bandwidth and feature-rich memory products targeted primarily at the networking and telecommunications markets. Increasing network complexity due to higher traffic volume and more advanced traffic content continues to drive OEMs' demand for high-performance networking memory. We believe our active high-performance memory product development and manufacturing expertise coupled with established strategic partnerships will continue to enable us to provide networking and telecommunications OEMs with the early access to next generation Very Fast SRAMs, Low Latency DRAMS, and Bandwidth Engine products that offer superior performance, advanced feature sets and continued high reliability, which they need to design and develop new products that support increasingly complex traffic content and to bring networking and telecommunications equipment to market quickly.

**Strengthen and Expand Customer Relationships.** We are focused on maintaining close relationships with industry leaders to facilitate rapid adoption of our products and to enhance our position as a leading provider of high-performance memory. We work with both our customers and with their non-memory IC suppliers that require high-performance memory support. We will continue to work with both groups at the pre-design and design stage of their projects in order to anticipate their future high-performance memory needs and to identify and respond to their immediate requests for currently available products and variants on currently available products. We plan to enhance our relationships with these leading OEMs and IC vendors and to develop similar relationships with additional OEMs and IC vendors.

**Continue to Invest in Research and Development to Extend Our Technology Leadership.** We believe we have established a position as a technology leader in the design and development of Very Fast SRAMs. Our Very Fast SRAM products most often provide the highest speed available at a given density for a given device configuration. We intend to maintain and advance our technology leadership through continual enhancement of our existing Very Fast SRAM products, particularly our SigmaQuad/SigmaDDR family of low latency, high-bandwidth synchronous SRAMs, while we continue to broaden our product line with the introduction of other new high performance memory technologies targeted to address the evolving needs of the high performance memory market.

**Collaborate with Wafer Foundries to Leverage Leading-edge Process Technologies.** We will continue to rely upon advanced complementary metal oxide semiconductor, or CMOS, technologies, the most commonly used process technologies for manufacturing semiconductor devices, from TSMC for SRAM-based products and from Powerchip for DRAM-based products. We provide our technology partners with the sort of in-depth feedback for yield and performance improvement that can best come from very large array structures like those found in our products. Our most advanced products currently in production were designed using 40 nanometer process technology on 300 millimeter wafers.

**Exploit Opportunities to Expand the Market for Our Memory Products.** While we develop our high-performance memory products specifically for the networking and telecommunications markets, they are often applicable across a wide range of industries and applications. We have experienced growth in product sales for



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military, industrial, test and measurement, and medical markets and intend to continue penetrating these and other new markets with similar needs for high-performance memory technologies.

Develop Products for New Markets. Following our recent acquisition of MikaMonu, we are devoting substantial efforts to the development of in-place associative computing solutions utilizing patented technology obtained in the acquisition. Products based on this cutting edge technology will address evolving new markets such as “big data” (including machine learning and deep convolutional neural networks (CNNs)), computer vision and cyber security. We intend to supplement our internal development activities by seeking additional opportunities to acquire other businesses, product lines or technologies, or enter into strategic partnerships, that would complement our current product lines, expand the breadth of our markets, enhance our technical capabilities, or otherwise provide growth opportunities.

Products

We design, develop and market a broad range of high-performance memory products primarily for the networking and telecommunications markets. We specialize in high performance memory products featuring very high transaction rates, high density, low latency, high bandwidth, fast clock access times and low power consumption. We commit to offering our products for longer periods of time than our competitors, typically seven years or more following their initial introduction. Accordingly, we continue to offer products in a variety of package types that have been discontinued by other suppliers.

We currently