GSI Technology

High Performance Memory
for Leading-Edge Technology

Didier Lasserre, Vice President Sales and Investor Relations
Doug Schirle, CFO | December 2019

Safe Harbor

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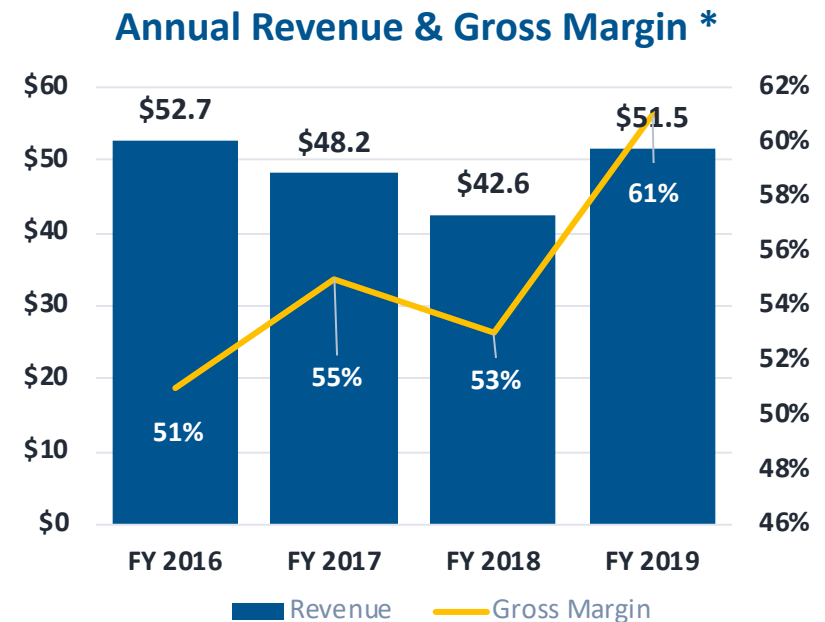
GSI Technology Overview

GSI memory devices are recognized for very high transaction rates, high density, low latency, high bandwidth, fast clock access times, and low power consumption.

- Largest portfolio of high-performance memory products
- Leadership team has 30+ years of experience in memory sector
- Acquired Israeli-based AI developer in 2015
- 35% insider ownership
- $175 million market cap*; NASDAQ: GSIT
- Based in Sunnyvale, CA

* Market capitalization based on closing share price as of November 15, 2019 and shares outstanding from the Company's Form 10-Q of 23,061,348 as of October 31, 2019.

Platform for Future Growth

- Pricing power has increased ASPs and gross margin on our core products

- Strategic uses of capital:
  - $5 M AI acquisition in CY 2015
  - $61 M of common stock repurchased to date
  - New product development funded with cash generated from legacy business
  - #1 priority use of cash is commercialization of AI processor

Annual Revenue & Gross Margin *

	FY 2016	FY 2017	FY 2018	FY 2019
Revenue	$52.7	$48.2	$42.6	$51.5
Gross Margin	51%	55%	53%	61%

Revenue ▬▬ Gross Margin

*Reflects March 31 fiscal year end

Self-Funding AI Start Up

($ in millions)	as of 09/30/2019
Liquidity: cash, cash equivalents, short-term investments and long-term investments	$72.9
Total assets	$108.8
Debt	$0.0
Shareholder Equity	$95.8
Balance Sheet Metrics	
Working capital	$75.6
Current ratio	10:1

Highly Capital Efficient

Well-run core business funding future growth opportunities

- Efficient business model – manufacture with TSMC using master die production process

- Strong cash generation historically; currently cash flow neutral

- 100% of R&D budget focused on bringing new products to market

  - $5+ million quarterly R&D spend to develop Gemini-I and the software and algorithm libraries

  - Core business and strong balance sheet provide necessary funding for product commercialization

Strong Competencies in Core Business

Industry leader in performance and capabilities

SigmaQuad™ and SigmaDDR™ - Core Business Growth Drivers

- Applications in switches, routers, military-aerospace and avionics
- Broadest product offering across all categories
- Best industry performance

SigmaQuad™ SRAMs Recognized for Best in Class Capabilities

- Recognized for capacity, performance, and unequaled transaction rates

3rd and 4th Generation SRAM

- Fastest off-the-shelf SRAM on market
- Higher reliability and lower power consumption
- Higher ASP and gross margin contribution

Advancing Our Business to New Markets

Developing Two Exciting New Product Lines

- Radiation Hardened and Radiation Tolerant chips for aerospace and defense leverage our core SRAM platform

- Gemini, patented in-place associative computing processor, unifies our AI innovation and core memory capabilities in a unique, memory-centric AI processor

New product categories are anticipated to return our top line to growth with **gross margins above corporate average** enabling a **return to profitability** and **increased cash flow**.

Radiation Hardened (Rad-Hard) SRAM

Sigma Quad Radiation Hardened SRAM for defense & aerospace

- Targeting satellites, missiles, high altitude flights

- First product: 288Mb SQII+; Second product: 144Mb NBT/SB

- Target products: 144Mb SQIV, 144Mb SQIII and Gemini

- 85%+ gross margin, with ~$30K ASP

- Also developed "Rad Tolerant" for low radiation applications
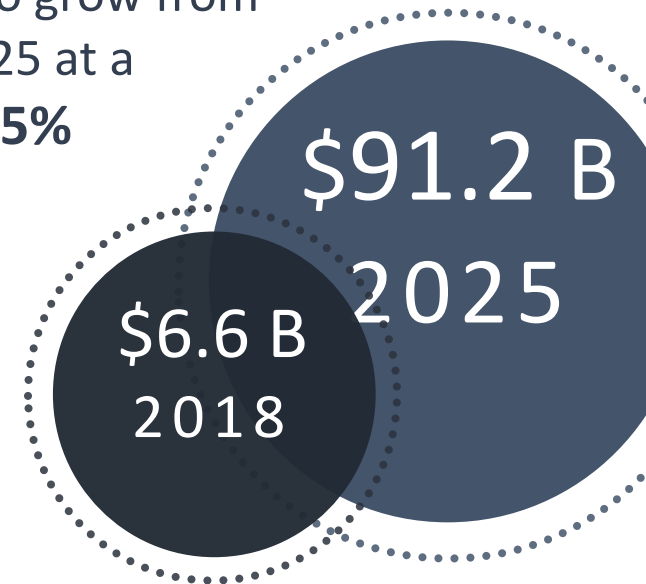
- **NEW:** Gemini-I radiation beam testing

Estimated Annual TAM of $20 - $25 Million

Advancing the AI Processor Model

New AI architecture for large market AI chip market

- Current AI architectures **limit computation speeds** and **require lots of power**

- Today's **extremely large data sets** need a new model
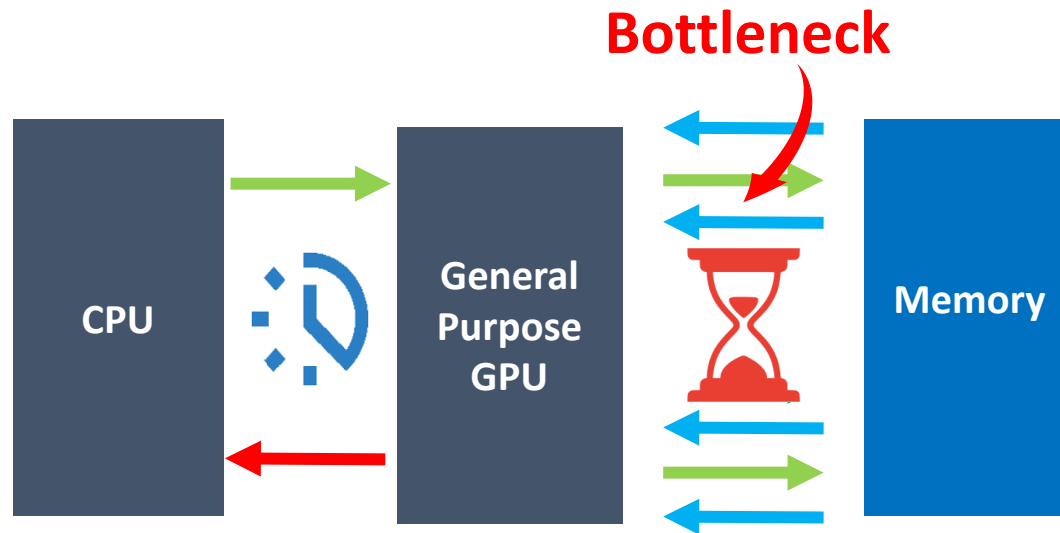
GSI's Gemini **improves computation times** and outcomes **using less power** with a **scalable architecture**

The global **AI chip market** is projected to grow from 2018 to 2025 at a **CAGR of 45%**

$91.2 B
2025

$6.6 B
2018

Source: Allied Market Research, Global Artificial Intelligence Chip Market by Chip type, Application, Technology, and Industry vertical; Global Forecast, 2019–2025.

Addressing the IO Bottleneck

von Neumann Model creates a Massive IO Bottleneck

Bottleneck

CPU

General Purpose GPU

Memory

- Slows computation rates due to throughput limitations
- High power consumption
- This architecture is **not scalable**

Memory-Centric Gemini Removes IO Bottleneck

Gemini revolutionary change to the computing model

Host CPU or FPGA

Gemini Memory & Processor

Computation and Search

Gemini mimics the brain's efficiency

- Removes IO bottleneck with direct response from Gemini to the host
- Computation time reduced from minutes to seconds or milliseconds
- Significant reduction of power consumption and system costs
- **Scalable – unique feature to Gemini**

GSI Hardware & Software Advantages

Core capabilities and strengths deliver big advantages

Gemini's Unique Capabilities

- Memory-centric design combines GSI's core-capabilities in memory chip design with AI software expertise

- Developing a programming interface that allows multiple levels of custom programing from assembly code up to TensorFlow Python

- Optimization of software and algorithms is key to Gemini performance

GSI and Gemini's Strengths

- Proven operational history, hardware design and AI expertise

- Depth of AI talent with 70+ engineers based in Israel and U.S.

- Extensive IP portfolio – 20 patents granted, 23 pending

What is Similarity Search in AI

Goal: retrieve database records most similar to the query

- **Machine learning techniques** create vector representations of database content that can be compared using simple distance metrics

- The **amount of content** managed by companies continues to grow

- Query very large **text or vectorized database with** 100s of millions to billions of items for matching or "most similar" results

- **Important elements** of search for business applications:

  - Accuracy in results – improved product recommendation increases conversion rates

  - Time required to complete search – increase productivity with faster outcomes for searches completed in less time

  - Power consumption – reducing overall power needs and operational costs

Gemini-I Leads in Similarity Search

Faster, improved accuracy, uses less power and scalable

Target markets where Gemini-I excels include:

- Signal detection for military applications
- Drug discovery, virtual drug screening, genomics
- Facial recognition in user and data security, and fraud prevention
- Online retail and home design where style is difficult to describe

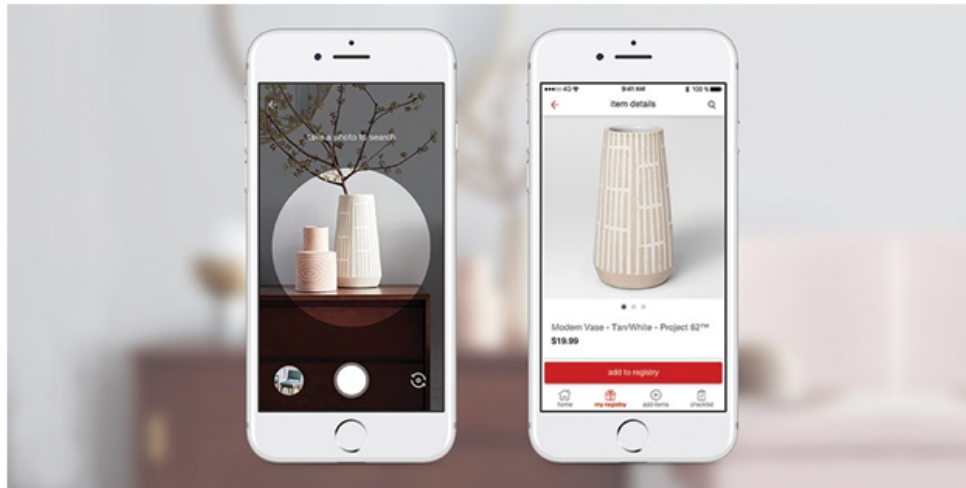| AI Application	Target Markets for Gemini-I	Nvidia GPU Google TPU Intel NERVANA NPP Graphcore IPU	ASIC	FPGA	Gemini-I
Similarity Search	Similar Signal Detection Facial Recognition Drug Discovery Drug Screening Genomics Recommender Systems Visual Search Video Search	✘	✘	✘	✔

Drug Discovery Customer Test

Goal: lower drug discovery costs and increase approval wins

- <u>Problem:</u> current CPU-based solutions – up to 20 minutes for a single "best-match" search.

- <u>Background:</u> average new drug development cost is around $2.6 billion. 90% fail to win approval.*

- <u>Task:</u> rapidly and accurately identify molecules that have similar properties to a query molecule with known properties.

- <u>Objective:</u> search for "seeds" molecules in 38 million molecule database to use in new drug synthesis and clinical trials.

- **Outcome: Gemini-I produces results in less than one second for multiple, simultaneous "best-matches"**

Source: Tufts Center for the Study of Drug Development (CSDD) study. *June 2018*

Visual Search in Retail AI

Replaces text-based descriptions with images or pictures

Use a photo to find retailers with similar items

Retail adoption of AI forecast to **exceed $8 billion by 2024** with **visual search** as the **fastest growing segment**

Source: Global Markets Insights, Inc. May 2018

Benchmarking with Search Standards

Influential marketing tool essential to raising awareness

- Using known similarity search industry standards
- FAISS (Facebook AI Similarity Search) and ANN (Approximate Nearest Neighbor)
- Have run smaller data sets (1 M and 10 M) with FPGA board (limited to 400 MHz) and second spin Gemini-I
- Larger data set benchmarks (100 M and 1 B) will be run with GSI's production board (full performance of 800 MHz) and Gemini-I third "spin"
- Power benchmarking run separately will use industry standard database
- **Anticipate publishing results by end of Q2 CY 2020**

Source: Tufts Center for the Study of Drug Development (CSDD) study. June 2018

Clear Path to Future Growth

- **Drive future growth and profitability by leveraging our leadership in high-performance memory products into new categories**
  - Developing Gemini for large, high growth AI markets
  - Executing to Gemini-I milestones to launch in late CY 2020
  - Launching Rad-Hard/Rad-Tolerant in CY 2020

- **Gemini-I milestones**

  - Year end CY 2019
    - Analyze third "spin" of Gemini-I

  - Q1 CY2020
    - Receive second "article" of production board
    - On-site training begins
    - Begin large dataset benchmarking

  - Q2 CY 2020
    - Publish benchmarking results for all datasets

Thank you!

GSI Technology

High Performance Components
for Leading-Edge Technology

GSITechnology.com / *IR Contact: GSIT@HaydenIR.com*

Appendix

AI Chip Landscape Overview

Gemini-I excels in similarity search

- Visual search requires high processing speeds and accuracy
- Gemini-I speed and accuracy is ideal for visual search
- Gemini-I performs in-line for inference, and is not optimized for training

Application	Nvidia GPU Google TPU Intel NERVANA NPP Graphcore IPU	ASIC	FPGA	Gemini-I
Similarity search	✗	✗	✗	✔+
Training	✔	✗	~	✗
Inference	~	✔	✔	✔

Income Statement

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)
(Unaudited)

	Three Months Ended			Six Months Ended	
	Sept. 30, 2019	June 30, 2019	Sept. 30, 2018	Sept. 30, 2019	Sept. 30, 2018
Net revenues	$ 11,740	$ 13,019	$ 12,832	$ 24,759	$ 24,098
Cost of goods sold	5,172	4,776	4,801	9,948	10,279
Gross profit	6,568	8,243	8,031	14,811	13,819
Operating expenses:					
Research & development	5,833	5,595	5,752	11,428	10,602
Selling, general and administrative	2,658	2,877	2,673	5,535	5,270
Total operating expenses	8,491	8,472	8,425	16,963	15,872
Operating income (loss)	(1,923)	(229)	(394)	(2,152)	(2,053)
Interest and other income (expense), net	210	147	145	357	168
Income (loss) before income taxes	(1,713)	(82)	(249)	(1,795)	(1,885)
Provision (benefit) for income taxes	55	43	102	98	112
Net income (loss)	$ (1,768)	$ (125)	$ (351)	$ (1,893)	$ (1,997)
Net income (loss) per share, basic	$ (0.08)	$ (0.01)	$ (0.02)	$ (0.08)	$ (0.09)
Net inocme (loss) per share, diluted	$ (0.08)	$ (0.01)	$ (0.02)	$. (0.08)	$ (0.09)
Weighted-average shares used in computing per share amounts:					
Basic	22,975	22,605	21,844	22,791	21,707
Diluted	22,975	22,605	21,844	22,791	21,707

Summary Balance Sheet

CONDENSED CONSOLIDATED BALANCE SHEETS
(in thousands)
(Unaudited)

	Sept. 30, 2019	March 31, 2019
Cash and cash equivalents	$ 45,724	$ 42,495
Short-term investments	22,352	19,346
Accounts receivable	7,488	7,339
Inventory	5,045	5,685
Other current assets	3,235	2,500
Net property and equipment	8,478	9,001
Long-term investments	4,788	8,997
Other assets	11,657	10,860
Total assets	$ 108,767	$ 106,223
Current liabilities	$ 8,277	$ 8,733
Long-term liabilities	4,721	4,335
Stockholders' equity	95,769	93,155
Total liabilities and stockholders' equity	$ 108,767	$ 106,223

Experienced Management Team

Name	Title	Years of Experience	Years with GSI	Prior Companies
Lee-Lean Shu	President and CEO,	38	23	Sony, AMD
Doug Schirle	Chief Financial Officer	38	20	Cypress, Pericom
Didier Lasserre	VP Sales and IR	31	22	Cypress, Solectron
Avidan Akerib	VP of Associative Computing	38	3	MikaMonu, NeoMagic
Patrick Chaung	SR VP of Memory Design	41	9	Sony, AMD
Robert Yau	VP of Engineering	38	23	Sony, Mosel Vitelic
Bor-Tay Wu	VP of Taiwan Operations	35	22	Atalent, AMD