GSI TECHNOLOGY
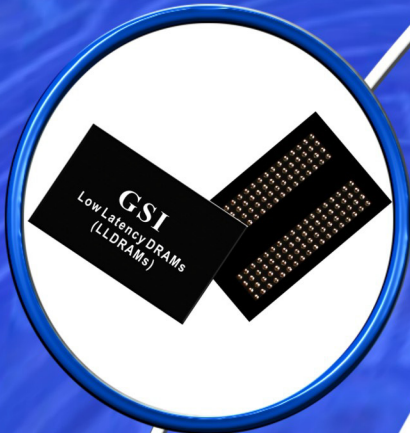
Low Latency DRAMs (LLDRAMs)

GSI's Low Latency DRAM (LLDRAM) is an ideal solution for advanced data networking applications. It offers an eight-bank, low-tRC memory array architecture, a simplified address interface, and double data transfer rates. The result is a device that can maintain near-100% bus utilization for many networking tasks.
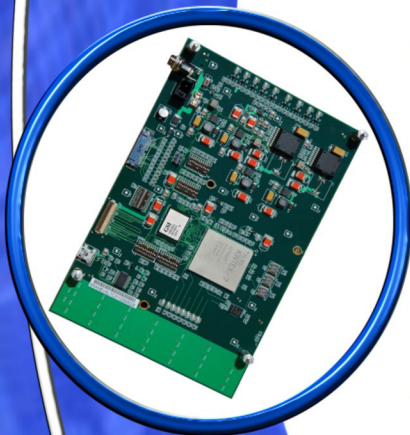
GSI's LLDRAM devices are ideal for 10GbE, 40GbE and 100GbE packet buffering, lookup tables, and inspection tasks. They are the technology of choice for a variety of Network Processor Units and FPGA Architectures.

Static RAMs (SRAMs)

GSI Technology designs, develops and markets a broad range of high performance SRAM products for networking, military, medical, automotive and other applications.

We specialize in SRAM products featuring very high transaction rates, high density, low latency, high bandwidth, fast clock access times, and low power consumption. We offer unusually long product support life cycles, short lead times, the largest high performance SRAM product portfolio in the market and complete pre and post-sale support.

IP Ports

GSI now offers IIIe SRAM interface IP Ports that can be used with various FPGAs.

IIIe SRAMs are GSI's fastest production SRAMs, and with GSI's SRAM IP Ports, users can get faster SRAM performance than ever before. GSI's SRAM IP Ports also give FPGA users access to ALL the modes of operation including those that, up to now, have only been available to ASIC users of Quad and DDR SRAMs.

Table of Contents

Low Latency DRAMs—3rd Generation
(LLDRAM III)

GSI's 3rd generation Low Latency DRAM (LLDRAM III) is an ideal solution for advanced data networking applications. It offers an eight-bank memory array architecture for high transaction rates, a reduced pin count address interface, and double data rate transfers, and is capable of maintaining near-100% bus utilization for many networking tasks.

It also offers higher density, lower power, and a lower active pin count compared to competing solutions, and the wider data bus (x20 and x40) available in the HSTL versions enables the use of data encoding schemes (e.g., 8b/10b) and ECC protection options (e.g., protecting 32-bit data quantums using 6 or 7 ECC parity bits) that are impractical in traditional x18 and x36 RAMs.

A lower power, lower pin count alternative to RLDRAM® 3 (Reduced Latency DRAM)
* 600 MHz DDR interface (1.2Gbit/s/pin) in Burst of 2
* 800 MHz DDR interface (1.6Gbit/s/pin) in Burst of 4
* Common (x18, x36) I/O
* 8-bank architecture
* ~13 ns tRC
* Multiplexed DDR address bus (requires half as many address pins as RLDRAM 3)

A complete set of design options:
* HSTL or POD I/O available
* Burst of 2 or Burst of 4 options
* Configurable read/write latencies & cycle times
* On-Die Input Termination
* IEEE 1149.1 boundary scan

<table>
<tr><td colspan="7" align="center">1.125Gb LLDRAM III
Common I/O</td></tr>
<tr><th>GSI P/N</th><th>Config</th><th>Core Voltage</th><th>I/O Voltage</th><th>Burst Length</th><th>Speed (MHz)</th><th>180 μBGA</th></tr>
<tr><td>GS4303T36yy-###
GS4303T18yy-###</td><td>36M x 36
64M x 18</td><td>1.5 V</td><td>1.0 and 1.2 V POD</td><td>2</td><td>600/500</td><td>●</td></tr>
<tr><td>GS4303R36yy-###
GS4303R18yy-###</td><td>36M x 36
64M x 18</td><td>1.5 V</td><td>1.0 and 1.2 V POD</td><td>4</td><td>800/667</td><td>●</td></tr>
<tr><td>GS4303TH36yy-###
GS4303TH18yy-###</td><td>36M x 36/40
64M x 18/20</td><td>1.5 V</td><td>1.2 V HSTL</td><td>2</td><td>600/500</td><td>●</td></tr>
<tr><td>GS4303RH36yy-###
GS4303RH18yy-###</td><td>36M x 36/40
64M x 18/20</td><td>1.5 V</td><td>1.2 V HSTL</td><td>4</td><td>800/667</td><td>●</td></tr>
</table>

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Low Latency DRAM—2nd Generation
(LLDRAM II)

GSI's 2nd generation Low Latency DRAM (LLDRAM II) is an ideal solution for advanced data networking applications. It offers an eight-bank memory array architecture for high transaction rates, a simplified address interface, and double data rate transfers. The result is a device that can maintain near-100% bus utilization for many networking tasks.

GSI's LLDRAM devices are ideal for 10GbE, 40GbE and 100GbE packet buffering, lookup tables, and inspection tasks. A variety of Network Processors and high performance FPGAs are already equipped with RAM ports ready to host LLDRAM II devices.

Drop-in compatible with RLDRAM 2 (Reduced Latency DRAM)
• 533 MHz DDR interface (1.067Gbit/s/pin)

• Common (x9, x18, x36) & Separate (x9, x18) I/O

• 8-bank architecture

• 15 ns tRC

• Single-cycle (SRAM-like) address load

A complete set of design options:
• Configurable read/write latencies & cycle times

• Configurable burst lengths (2/4/8)

• On-Die Input Termination

• IEEE 1149.1 boundary scan

• Traditional multiplexed address bus option for backward compatibility

576Mb LLDRAM II							
GSI P/N	**Config**	**V_{EXT} and V_{DD} Voltage**	**I/O Voltage**	**I/O**		**Speed (MHz)**	**144 μBGA**
				Common	**Separate**		
GS4576C36yy-### GS4576C18yy-### GS4576C09yy-###	16M x 36 32M x 18 64M x 9	V_{EXT}—2.5 V V_{DD}—1.8 V	1.5 and 1.8 V HSTL	✔		533/400/300	🔴
GS4576S18yy-### GS4576S09yy-###	16M x 36 32M x 18	V_{EXT}—2.5 V V_{DD}—1.8 V	1.5 and 1.8 V HSTL		✔	533/400/300	🔴
288Mb LLDRAM II							
GSI P/N	**Config**	**V_{EXT} and V_{DD} Voltage**	**I/O Voltage**	**I/O**		**Speed (MHz)**	**144 μBGA**
				Common	**Separate**		
GS4288C36yy-### GS4288C18yy-### GS4288C09yy-###	8M x 36 16M x 18 32M x 9	V_{EXT}—2.5 V V_{DD}—1.8 V	1.5 and 1.8 V HSTL	✔		533/400/300	🔴
GS4288S18yy-### GS4288S09yy-###	8M x 36 16M x 18	V_{EXT}—2.5 V V_{DD}—1.8 V	1.5 and 1.8 V HSTL		✔	533/400/300	🔴

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options. Contact your sales representative for Extended, Automotive, or Military temperature option parts.

The Fastest SRAM for FPGA
SigmaQuad-IIIe^{TM} & SigmaDDR-IIIe^{TM}
with
Validated SRAM IP Ports

GSI SigmaQuad/SigmaDDR-IIIe SRAM customers now have access to free, well documented, validated SRAM IP Ports for Xilinx Virtex-6 and 7 Series FPGAs. Support for Altera Stratix-V FPGAs is expected later in 2014. Loaner demo boards are available.

Don't Waste Pins

GSI's SRAM IP Ports support both the Separate I/O Quad and Common I/O DDR versions of these devices, as well as x18 and x36 data bus widths, so you can pick the optimum device for your application.

Double Your Transaction Rate Performance

GSI's SRAM IP Ports not only support the traditional Burst of 4 versions of the Quad SRAMs, they also support the Burst of 2 versions that deliver TWICE the Transaction Rate performance of the B4 Quad devices.

Don't Waste Time

GSI's SRAM IP Ports have been validated and are ready to run. Load it and get going with GSI's highest performance SRAM memory products NOW.

IP Port FAQ

How is our high level of performance achieved?

- The controller performs per-pin timing training on all Double Data Rate (DDR) synchronous I/O signals transmitted between the FPGA and the SRAM (i.e., on all SRAM DDR inputs and outputs). The training optimizes the setup and hold window of each signal around its associated reference clock, thereby compensating for any pin-to-pin skew between signals. High performance capability is also aided by the clean I/O windows that are a product of the IIIe SRAM's robust 260-pin BGA packaging.
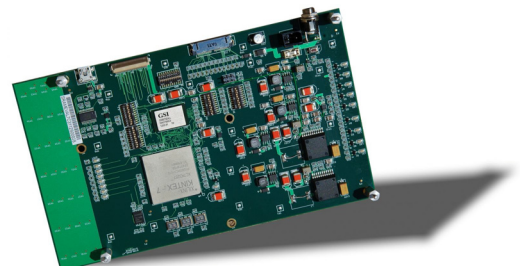
What files & documents are available?

- FPGA Development Environment: Verilog source code, user configuration file, simulation model, IP user guide
- PCB Hardware: Schematics, layout Gerber files, Bill of Materials, hardware user guide

Questions?

Features/Downloads/Documentation: IIIeInfo@gsitechnology.com.
IP Installation/Timing/Debug: apps@gsitechnology.com.

SigmaQuad-IIIe SRAMs

288Mb SigmaQuad-IIIe^{TM}

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong/None	Speed (MHz)	Voltage	260 BGA
GS82583EQ36yy-### GS82583EQ18yy-###	8M x 36 16M x 18	2	3	✔	500/450/400	V_{DD}—1.2 V V_{DDQ}—1.2 V/1.5 V	◖
GS82583ED36yy-### GS82583ED18yy-###	8M x 36 16M x 18	4	3	✔	633/550/500	V_{DD}—1.2 V V_{DDQ}—1.2 V/1.5 V	◖

72Mb SigmaQuad-IIIe^{TM}
ECCRAMs^{TM} (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong/None	Speed (MHz)	Voltage	260 BGA
GS8673EQ36Byy-### GS8673EQ18Byy-###	2M x 36 4M x 18	2	3	✔	675/625/550/500	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	◖
GS8673ED36Byy-### GS8673ED18Byy-###	2M x 36 4M x 18	4	3	✔	675/625/550/500	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	◖

72Mb SigmaQuad-IIIe^{TM}—For Use with the GSI RAM Port
ECCRAMs^{TM} (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong/None	Speed (MHz)	Voltage	260 BGA
GS8673EQ36Byy-###S GS8673EQ18Byy-###S	2M x 36 4M x 18	2	3	✔	725/625/550	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	◖
GS8673ED36Byy-###S GS8673ED18Byy-###S	2M x 36 4M x 18	4	3	✔	725/625/550	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	◖

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SigmaQuad-II and SigmaQuad-II+ SRAMs

288Mb SigmaQuad-II+^{TM}

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/ Strong	ODT Weak/ None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS82582QT38yy-### GS82582QT20yy-###	8M x 36 16M x 18	2	2.5	✔		500/450/400/375	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖
GS82582Q38yy-### GS82582Q20yy-###	8M x 36 16M x 18	2	2.5		✔	500/450/400/375	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖
GS82582QT37yy-### GS82582QT19yy-###	8M x 36 16M x 18	2	2.0	✔		400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖
GS82582Q37yy-### GS82582Q19yy-###	8M x 36 16M x 18	2	2.0		✔	400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖

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Package Notes:
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● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options. Contact your sales representative for Extended or Military temperature option parts.

SigmaQuad-II and SigmaQuad-II+ SRAMs

288Mb SigmaQuad-II+™
(Continued)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS82582DT38yy-### GS82582DT20yy-###	8M x 36 16M x 18	4	2.5	✔		550/500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS82582D38yy-### GS82582D20yy-###	8M x 36 16M x 18	4	2.5		✔	550/500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS82582DT37yy-### GS82582DT19yy-###	8M x 36 16M x 18	4	2.0	✔		450/400/375/333	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS82582D37yy-### GS82582D19yy-###	8M x 36 16M x 18	4	2.0		✔	450/400/375/333	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

288Mb SigmaQuad-II™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS82582Q36yy-### GS82582Q18yy-###	8M x 36 16M x 18	2	1.5	n/a	n/a	357/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS82582D36yy-### GS82582D18yy-###	8M x 36 16M x 18	4	1.5	n/a	n/a	400/375/333/ 300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

144Mb SigmaQuad-II+™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302QT37yy-### GS81302QT19yy-### GS81302QT10yy-### GS81302QT07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.0	✔		318/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS81302Q37yy-### GS81302Q19yy-### GS81302Q10yy-### GS81302Q07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.0		✔	318/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS81302DT38yy-### GS81302DT20yy-### GS81302DT11yy-### GS81302DT06yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	2.5	✔		500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS81302D38yy-### GS81302D20yy-### GS81302D11yy-### GS81302D06yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	2.5		✔	500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS81302DT37yy-### GS81302DT19yy-### GS81302DT10yy-### GS81302DT07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

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Part Number Notes:
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All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

SigmaQuad-II and SigmaQuad-II+ SRAMs

144Mb SigmaQuad-II+^{TM}
(Continued)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302D37yy-### GS81302D19yy-### GS81302D10yy-### GS81302D07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	2.0		✓	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

144Mb SigmaQuad-II^{TM}

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302Q36yy-### GS81302Q18yy-### GS81302Q09yy-### GS81302Q08yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	1.5	n/a	n/a	300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS81302D36yy-### GS81302D18yy-### GS81302D09yy-### GS81302D08yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	1.5	n/a	n/a	375/350/333/ 300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

72Mb SigmaQuad-II+^{TM}
ECCRAMs^{TM} (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8672Q38Byy-### GS8672Q20Byy-###	2M x 36 4M x 18	2	2.5		✓	500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V		◐
GS8672Q37Byy-### GS8672Q19Byy-###	2M x 36 4M x 18	2	2.0		✓	450/400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V		◐
GS8672D38Byy-### GS8672D20Byy-###	2M x 36 4M x 18	4	2.5		✓	633/550/500/ 450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V		◐
GS8672D37Byy-### GS8672D19Byy-###	2M x 36 4M x 18	4	2.0		✓	450/400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V		◐

72Mb SigmaQuad-II+^{TM}
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662QT37Byy-### GS8662QT19Byy-### GS8662QT10Byy-### GS8662QT07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.0	✓		357/333/300/ 250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	

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⬤ = Available ONLY in 5/6 RoHS-compliant packages.

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All parts are available in Commercial and Industrial temperature options.
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SigmaQuad-II and SigmaQuad-II+ SRAMs

72Mb SigmaQuad-II+™
(Rev. B—Continued)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662Q37Byy-### GS8662Q19Byy-### GS8662Q10Byy-### GS8662Q07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.0		✔	357/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	
GS8662DT38Byy-### GS8662DT20Byy-### GS8662DT11Byy-### GS8662DT06Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	2.5	✔		550/500/450/400/350 (x18/x36) 500/450/400/350 (x8/x9)	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	
GS8662D38Byy-### GS8662D20Byy-### GS8662D11Byy-### GS8662D06Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	2.5		✔	550/500/450/400/350 (x8/x18/x36) 500/450/400/350 (x9)	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	
GS8662DT37Byy-### GS8662DT19Byy-### GS8662DT10Byy-### GS8662DT07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	
GS8662D37Byy-### GS8662D19Byy-### GS8662D10Byy-### GS8662D07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	2.0		✔	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	

72Mb SigmaQuad-II™
ECCRAMs™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8672Q36Byy-### GS8672Q18Byy-###	2M x 36 4M x 18	2	1.5	n/a	n/a	400/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐
GS8672D36Byy-### GS8672D18Byy-###	2M x 36 4M x 18	4	1.5	n/a	n/a	400/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◐

72Mb SigmaQuad-II™
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662Q36Byy-### GS8662Q18Byy-### GS8662Q09Byy-### GS8662Q08Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	1.5	n/a	n/a	357/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	
GS8662D36Byy-### GS8662D18Byy-### GS8662D09Byy-### GS8662D08Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◐	

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SigmaQuad-II and SigmaQuad-II+ SRAMs

36Mb SigmaQuad-II+™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8342QT37Byy-### GS8342QT19Byy-### GS8342QT10Byy-### GS8342QT07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.0	✔		357/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342Q37Byy-### GS8342Q19Byy-### GS8342Q10Byy-### GS8342Q07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.0		✔	357/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342DT38Byy-### GS8342DT20Byy-### GS8342DT11Byy-### GS8342DT06Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	2.5	✔		550/500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342D38Byy-### GS8342D20Byy-### GS8342D11Byy-### GS8342D06Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	2.5		✔	550/500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342DT37Byy-### GS8342DT19Byy-### GS8342DT10Byy-### GS8342DT07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342D37Byy-### GS8342D19Byy-### GS8342D10Byy-### GS8342D07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	2.0		✔	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	

36Mb SigmaQuad-II™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8342Q36Byy-### GS8342Q18Byy-### GS8342Q09Byy-### GS8342Q08Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	1.5	n/a	n/a	357/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	
GS8342D36Byy-### GS8342D18Byy-### GS8342D09Byy-### GS8342D08Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	

18Mb SigmaQuad-II+™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8182D37Byy-### GS8182D19Byy-###	512K x 36 1M x 18	4	2.0	n/a	n/a	435/400/ 375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◗	

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Package Notes:
◗ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

SigmaQuad-II and SigmaQuad-II+ SRAMs

GSI P/N	Config	Burst Length	Read Latency	ODT		Speed (MHz)	Voltage	165 BGA	
				Weak/ Strong	Weak/ None			13 x 15 mm (D)	15 x 17 mm (E)
GS8182Q36Byy-### GS8182Q18Byy-### GS8182Q09Byy-### GS8182Q08Byy-###	512K x 36 1M x 18 2M x 9 2M x 8	2	1.5	n/a	n/a	333/300/250/ 200/167/133	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◖	
GS8182D36Byy-### GS8182D18Byy-### GS8182D09Byy-### GS8182D08Byy-###	512K x 36 1M x 18 2M x 9 2M x 8	4	1.5	n/a	n/a	400/375/333/300/250/ 200/167	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◖	

18Mb SigmaQuad-II™ (Rev. B)

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SigmaQuad SRAMs

GSI P/N	Config	Burst Length	Read Latency	ODT		Speed (MHz)	Voltage	165 BGA	
				Weak/ Strong	Weak/ None			13 x 15 mm (D)	15 x 17 mm (E)
GS8180QV36Byy-### GS8180QV18Byy-###	512K x 36 1M x 18	2	1.5	n/a	n/a	200/167	V_{DD}—2.5 V V_{DDQ}—1.5 V/1.8 V	◖	

18Mb SigmaQuad™ (Rev. B)

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SigmaDDR-IIIe SRAMs

288Mb SigmaDDR-IIIe™							
GSI P/N	**Config**	**Burst Length**	**Read Latency**	**ODT** Weak/Strong/None	**Speed (MHz)**	**Voltage**	**260 BGA**
GS82583ET36yy-### GS82583ET18yy-###	8M x 36 16M x 18	2	3	✔	633/550/500	V_{DD}—1.2 V V_{DDQ}—1.2 V/1.5 V	

72Mb SigmaDDR-IIIe™ ECCRAMs™ (Rev. B)							
GSI P/N	**Config**	**Burst Length**	**Read Latency**	**ODT** Weak/Strong/None	**Speed (MHz)**	**Voltage**	**260 BGA**
GS8673ET36Byy-### GS8673ET18Byy-###	2M x 36 4M x 18	2	3	✔	675/625/550/500	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	

72Mb SigmaDDR-IIIe™—For Use with the GSI RAM Port ECCRAMs™ (Rev. B)							
GSI P/N	**Config**	**Burst Length**	**Read Latency**	**ODT** Weak/Strong/None	**Speed (MHz)**	**Voltage**	**260 BGA**
GS8673ET36Byy-###S GS8673ET18Byy-###S	2M x 36 4M x 18	2	3	✔	725/625/550	V_{DD}—1.35 V V_{DDQ}—1.2 V/1.5 V	

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SigmaDDR-II and SigmaDDR-II+ SRAMs

288Mb SigmaQuad-II+™									
GSI P/N	**Config**	**Burst Length**	**Read Latency**	**ODT** Weak/Strong	**ODT** Weak/None	**Speed (MHz)**	**Voltage**	**165 BGA** 13 x 15 mm (D)	**165 BGA** 15 x 17 mm (E)
GS82582TT38yy-### GS82582TT20yy-###	8M x 36 16M x 18	2	2.5	✔		550/500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		
GS82582T38yy-### GS82582T20yy-###	8M x 36 16M x 18	2	2.5		✔	550/500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		
GS82582TT37yy-### GS82582TT19yy-###	8M x 36 16M x 18	2	2.0	✔		450/400/375/333	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		
GS82582T37yy-### GS82582T19yy-###	8M x 36 16M x 18	2	2.0		✔	450/400/375/333	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		

288Mb SigmaQuad-II™									
GSI P/N	**Config**	**Burst Length**	**Read Latency**	**ODT** Weak/Strong	**ODT** Weak/None	**Speed (MHz)**	**Voltage**	**165 BGA** 13 x 15 mm (D)	**165 BGA** 15 x 17 mm (E)
GS82582T36yy-### GS82582T18yy-###	8M x 36 16M x 18	2	1.5	n/a	n/a	400/375/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		
GS82582R36yy-### GS82582R18yy-###	8M x 36 16M x 18	4	1.5	n/a	n/a	400/375/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		

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Package Notes:

 = Available in 6/6 AND 5/6 RoHS-compliant packages.

 = Available ONLY in 6/6 RoHS-compliant packages.

 = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

SigmaDDR-II and SigmaDDR-II+ SRAMs

144Mb SigmaDDR-II+™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302TT38yy-### GS81302TT20yy-### GS81302TT11yy-### GS81302TT06yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.5	✔		500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗
GS81302T38yy-### GS81302T20yy-### GS81302T11yy-### GS81302T06yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.5		✔	500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗
GS81302TT37yy-### GS81302TT19yy-### GS81302TT10yy-### GS81302TT07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗
GS81302T37yy-### GS81302T19yy-### GS81302T10yy-### GS81302T07yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	2.0		✔	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗

144Mb SigmaDDR-II™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302T36yy-### GS81302T18yy-### GS81302T09yy-### GS81302T08yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	1.5	n/a	n/a	375/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗
GS81302R36yy-### GS81302R18yy-### GS81302R09yy-### GS81302R08yy-###	4M x 36 8M x 18 16M x 9 16M x 8	4	1.5	n/a	n/a	375/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◗

72Mb SigmaDDR-II+™
ECCRAMs™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8672T38Byy-### GS8672T20Byy-###	2M x 36 4M x 18	2	2.5		✔	633/550/500/450/400	V_{DD}—1.8 V V_{DDQ}—1.5 V		◗
GS8672T37Byy-### GS8672T19Byy-###	2M x 36 4M x 18	2	2.0	n/a	n/a	450/400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V		◗

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Package Notes:
◗ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
◓ = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options. Contact your sales representative for Extended or Military temperature option parts.

SigmaDDR-II and SigmaDDR-II+ SRAMs

72Mb SigmaDDR-II+^{TM}
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662TT38Byy-### GS8662TT20Byy-### GS8662TT11Byy-### GS8662TT06Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.5	✔		550/500/450/400/350 (x8/x18/x36) 500/450/400/340/333 (x9)	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8662T38Byy-### GS8662T20Byy-### GS8662T11Byy-### GS8662T06Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.5		✔	550/500/450/400/350 (x8/x18/x36) 500/450/400/340/333 (x9)	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8662TT37Byy-### GS8662TT19Byy-### GS8662TT10Byy-### GS8662TT07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8662T37Byy-### GS8662T19Byy-### GS8662T10Byy-### GS8662T07Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	2.0		✔	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	

72Mb SigmaDDR-II^{TM}
ECCRAMs^{TM} (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8672T36Byy-### GS8672T18Byy-###	2M x 36 4M x 18	2	1.5	n/a	n/a	400/333/300/250/200	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		●

72Mb SigmaDDR-II^{TM}
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662T36Byy-### GS8662T18Byy-### GS8662T09Byy-### GS8662T08Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8662R36Byy-### GS8662R18Byy-### GS8662R09Byy-### GS8662R08Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	4	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	

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SigmaDDR-II and SigmaDDR-II+ SRAMs

36Mb SigmaDDR-II+™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8342TT38Byy-### GS8342TT20Byy-### GS8342TT11Byy-### GS8342TT06Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.5	✔		550/500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8342T38Byy-### GS8342T20Byy-### GS8342T11Byy-### GS8342T06Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.5		✔	550/500/450/400/350	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8342TT37Byy-### GS8342TT19Byy-### GS8342TT10Byy-### GS8342TT07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.0	✔		450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8342T37Byy-### GS8342T19Byy-### GS8342T10Byy-### GS8342T07Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	2.0		✔	450/400/350/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	

36Mb SigmaDDR-II™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8342T36Byy-### GS8342T18Byy-### GS8342T09Byy-### GS8342T08Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	2	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	
GS8342R36Byy-### GS8342R18Byy-### GS8342R09Byy-### GS8342R08Byy-###	1M x 36 2M x 18 4M x 9 4M x 8	4	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	

18Mb SigmaDDR-II+™ (Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/Strong	ODT Weak/None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8182T37Byy-### GS8182T19Byy-###	512K x 36 1M x 18	2	2.0	n/a	n/a	435/400/375/333/300	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	●	

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Package Notes:
● = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

SigmaDDR-II and SigmaDDR-II+ SRAMs

18Mb SigmaDDR-II™
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/ Strong	ODT Weak/ None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8182T36Byy-### GS8182T18Byy-### GS8182T09Byy-### GS8182T08Byy-###	512K x 36 1M x 18 2M x 9 2M x 8	2	1.5	n/a	n/a	400/375/333/300/ 250/200/167	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◖◗	
GS8182R36Byy-### GS8182R18Byy-### GS8182R09Byy-### GS8182R08Byy-###	512K x 36 1M x 18 2M x 9 2M x 8	4	1.5	n/a	n/a	400/375/333/300/ 250/200/167	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◖◗	

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SigmaSIO DDR-II SRAMs

288Mb SigmaSIO DDR-II™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/ Strong	ODT Weak/ None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS82582S36yy-### GS82582S18yy-###	8M x 36 16M x 18	2	1.5	n/a	n/a	400/375/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖◗

144Mb SigmaSIO DDR-II™

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/ Strong	ODT Weak/ None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS81302S36yy-### GS81302S18yy-### GS81302S09yy-### GS81302S08yy-###	4M x 36 8M x 18 16M x 9 16M x 8	2	1.5	n/a	n/a	375/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V		◖◗

72Mb SigmaSIO DDR-II™
(Rev. B)

GSI P/N	Config	Burst Length	Read Latency	ODT Weak/ Strong	ODT Weak/ None	Speed (MHz)	Voltage	165 BGA 13 x 15 mm (D)	165 BGA 15 x 17 mm (E)
GS8662S36Byy-### GS8662S18Byy-### GS8662S09Byy-### GS8662S08Byy-###	2M x 36 4M x 18 8M x 9 8M x 8	2	1.5	n/a	n/a	400/350/333/300/250	V_{DD}—1.8 V V_{DDQ}—1.5 V/1.8 V	◖◗	

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Package Notes:
◖◗ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

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SigmaSIO DDR-II SRAMs

<table>
<tr><td colspan="11" align="center">36Mb SigmaSIO DDR-IITM
(Rev. B)</td></tr>
<tr>
<td rowspan="3">GSI P/N</td>
<td rowspan="3">Config</td>
<td rowspan="3">Burst Length</td>
<td rowspan="3">Read Latency</td>
<td colspan="2">ODT</td>
<td rowspan="3">Speed (MHz)</td>
<td rowspan="3">Voltage</td>
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<tr>
<td rowspan="2">Weak/ Strong</td>
<td rowspan="2">Weak/ None</td>
<td>13 x 15 mm (D)</td>
<td>15 x 17 mm (E)</td>
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<tr>
<td>GS8342S36Byy-###
GS8342S18Byy-###
GS8342S09Byy-###
GS8342S08Byy-###</td>
<td>1M x 36
2M x 18
4M x 9
4M x 8</td>
<td>2</td>
<td>1.5</td>
<td>n/a</td>
<td>n/a</td>
<td>400/350/333/300/250</td>
<td>V_{DD}—1.8 V
V_{DDQ}—1.5 V/1.8 V</td>
<td align="center">◑</td>
<td></td>
</tr>
<tr><td colspan="11" align="center">18Mb SigmaSIO DDR-IITM
(Rev. B)</td></tr>
<tr>
<td rowspan="3">GSI P/N</td>
<td rowspan="3">Config</td>
<td rowspan="3">Burst Length</td>
<td rowspan="3">Read Latency</td>
<td colspan="2">ODT</td>
<td rowspan="3">Speed (MHz)</td>
<td rowspan="3">Voltage</td>
<td colspan="2">165 BGA</td>
</tr>
<tr>
<td rowspan="2">Weak/ Strong</td>
<td rowspan="2">Weak/ None</td>
<td>13 x 15 mm (D)</td>
<td>15 x 17 mm (E)</td>
</tr>
<tr><td></td><td></td></tr>
<tr>
<td>GS8182S36Byy-###
GS8182S18Byy-###
GS8182S09Byy-###
GS8182S08Byy-###</td>
<td>512K x 36
1M x 18
2M x 9
2M x 8</td>
<td>2</td>
<td>1.5</td>
<td>n/a</td>
<td>n/a</td>
<td>400/375/333/300/250/
200/167</td>
<td>V_{DD}—1.8 V
V_{DDQ}—1.5 V/1.8 V</td>
<td align="center">◑</td>
<td></td>
</tr>
</table>

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No Bus Turnaround (NBT™) SRAMs

144Mb (2-Die Module)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD V_DDQ	Packages BGA 119 (B)	165 (D)	165 (E)	209 (C)	TQFP 100 (GT)	Features FT/PL	JTAG	FLXDrive™
GS81284Z36yy-### GS81284Z18yy-###	4M x 36 8M x 18	250/ 200/167	2.5–3.4	2.5/3.3	[6/6&5/6]					✔	✔	✔
GS81284Z36yy-###V GS81284Z18yy-###V	4M x 36 8M x 18	200/167	3.0–3.4	1.8/2.5	[6/6&5/6]					✔	✔	✔

72Mb

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD V_DDQ	Packages BGA 119 (B)	165 (D)	165 (E)	209 (C)	TQFP 100 (GT)	Features FT/PL	JTAG	FLXDrive™
GS8642Z72yy-### GS8642Z36yy-### GS8642Z18yy-###	1M x 72 2M x 36 4M x 18	300/250/ 200/167	2.3–3.5	2.5/3.3	[6/6&5/6]			[6/6&5/6]		✔	✔	✔
GS8640FZ36yy-### GS8640FZ18yy-###	2M x 36 4M x 18	5.5/6.5/ 7.5/8 (ns)	n/a	2.5/3.3					[6/6]	FT Only		
GS8640Z36yy-### GS8640Z18yy-###	2M x 36 4M x 18	300/250/ 200/167	2.3–3.5	2.5/3.3					[6/6]	✔		
GS8644Z36yy-### GS8644Z18yy-###	2M x 36 4M x 18	250/225/200/ 166/150/133	2.5–4.0	2.5/3.3			[6/6&5/6]			✔	✔	✔
GS8642Z72yy-###V GS8642Z36yy-###V GS8642Z18yy-###V	1M x 72 2M x 36 4M x 18	250/200/ 167	3.0–3.5	1.8/2.5	[6/6&5/6]			[6/6&5/6]		✔	✔	✔
GS8640FZ36yy-###V GS8640FZ18yy-###V	2M x 36 4M x 18	6.5/7.5/ 8 (ns)	n/a	1.8/2.5					[6/6]	FT Only		
GS8640Z36yy-###V GS8640Z18yy-###V	2M x 36 4M x 18	250/200/ 167	3.0–3.5	1.8/2.5					[6/6]	✔		
GS8644Z36yy-###V GS8644Z18yy-###V	2M x 36 4M x 18	250/225/200/ 166/150/133	2.5–4.0	1.8/2.5			[6/6&5/6]			✔	✔	✔

36Mb (Rev. A)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD V_DDQ	Packages BGA 119 (B)	165 (D)	165 (E)	209 (C)	TQFP 100 (GT)	Features FT/PL	JTAG	FLXDrive™
GS8322Z36Ayy-### GS8322Z18Ayy-###	1M x 36 2M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3	[6/6&5/6]	[6/6&5/6]				✔	✔	✔
GS8321Z36Ayy-### GS8321Z32Ayy-### GS8321Z18Ayy-###	1M x 36 1M x 32 2M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3		[6/6&5/6]				✔	✔	
GS8320Z36Ayy-### GS8320Z18Ayy-###	1M x 36 2M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					[6/6]	✔		

Package Notes:
[6/6&5/6] = Available in 6/6 AND 5/6 RoHS-compliant packages.
[6/6] = Available ONLY in 6/6 RoHS-compliant packages.
[5/6] = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options. Contact your sales representative for Extended or Military temperature option parts.

No Bus Turnaround (NBT^TM) SRAMs (Continued)

36Mb (Rev. A—Continued)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V$_{DD}$ V$_{DDQ}$	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	JTAG	FLXDrive™
GS8322Z36Ayy-###V GS8322Z18Ayy-###V	1M x 36 2M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5	◑	◑				✓	✓	✓
GS8321Z36Ayy-###V GS8321Z32Ayy-###V GS8321Z18Ayy-###V	1M x 36 1M x 32 2M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5		◑				✓	✓	
GS8320Z36Ayy-###V GS8320Z18Ayy-###V	1M x 36 2M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5					●	✓		

36Mb (Original Rev.)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V$_{DD}$ V$_{DDQ}$	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD
GS8322Z72yy-###	512K x 72	250/225/200/166/ 150/133	2.5–4.0	2.5/3.3				◑		✓	✓	✓
GS8322Z72yy-###V	512K x 72	250/225/200/166/ 150/133	3.0–4.0	1.8/2.5				◑		✓	✓	✓

18Mb (Rev. D)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V$_{DD}$ V$_{DDQ}$	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	JTAG	FLXDrive™
GS8162Z36Dyy-### GS8162Z18Dyy-###	512K x 36 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3	◑	◑				✓	✓	✓
GS8161Z36Dyy-### GS8161Z32Dyy-### GS8161Z18Dyy-###	512K x 36 512K x 32 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3		◑			●	✓	✓	
GS8160Z36Dyy-### GS8160Z18Dyy-###	512K x 36 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					●	✓		
GS8162Z36Dyy-###V GS8162Z18Dyy-###V	512K x 36 1M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5	◑	◑				✓	✓	✓
GS8161Z36Dyy-###V GS8161Z32Dyy-###V GS8161Z18Dyy-###V	512K x 36 512K x 32 1M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5		◑			●	✓	✓	
GS8160Z36Dyy-###V GS8160Z18Dyy-###V	512K x 36 1M x 18	333/250/ 200/150	3.0–3.8	1.8/2.5					●	✓		

Package Notes:
◑ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
◐ = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

No Bus Turnaround (NBT™) SRAMs (Continued)

18Mb (Rev. C)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD V_DDQ	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	JTAG	FLXDrive™
GS8162Z72Cyy-###	256K x 72	333/300/250/200/150	2.8–3.8	2.5/3.3				◐		✔	✔	✔
GS8162Z72Cyy-###V	256K x 72	250/200/150	3.0–3.8	1.8/2.5				◐		✔	✔	✔

9Mb (Rev. C)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD V_DDQ	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	JTAG	FLXDrive™
GS882Z36Cyy-### / GS882Z18Cyy-###	256K x 36 / 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3	◐	◐				✔	✔	✔
GS881Z36Cyy-### / GS881Z32Cyy-### / GS881Z18Cyy-###	256K x 36 / 256K x 32 / 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3		◐			●	✔	✔	
GS880Z36Cyy-### / GS880Z18Cyy-###	256K x 36 / 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3					●	✔		
GS882Z36Cyy-###V / GS882Z18Cyy-###V	256K x 36 / 512K x 18	250/200/150	3.0–3.8	1.8/2.5	◐	◐				✔	✔	✔
GS881Z36Cyy-###V / GS881Z32Cyy-###V / GS881Z18Cyy-###V	256K x 36 / 256K x 32 / 512K x 18	250/200/150	3.0–3.8	1.8/2.5		◐			●	✔	✔	
GS880Z36Cyy-###V / GS880Z18Cyy-###V	256K x 36 / 512K x 18	250/200/150	3.0–3.8	1.8/2.5					●	✔		

4Mb (Rev. C)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_DD & V_DDQ	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	JTAG	FLXDrive™
GS842Z36Cyy-### / GS842Z18Cyy-###	128K x 36 / 256K x 18	250/200/166/150/100	3.2–4.5	3.3 2.5/3.3	◐					✔	✔	✔
GS841Z36Cyy-### / GS841Z18Cyy-###	128K x 36 / 256K x 18	250/200/166/150/100	3.2–4.5	3.3 2.5/3.3					●	✔	✔	
GS840Z36Cyy-### / GS840Z18Cyy-###	128K x 36 / 256K x 18	250/200/166/150/100	3.2–4.5	3.3 2.5/3.3					●	✔		

Synchronous Burst (SyncBurst™) SRAMs

144Mb (2-Die Module)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	BGA 119 (B)	BGA 165 (D)	BGA 165 (E)	BGA 209 (C)	TQFP 100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS8128436yy-### GS8128418yy-###	4M x 36 8M x 18	250/200/167	2.5–3.4	2.5/3.3	◐					✔	✔	✔	✔	✔
GS8128436yy-###V GS8128418yy-###V	4M x 36 8M x 18	200/167	3.0–3.4	1.8/2.5	●					✔	✔	✔	✔	✔

72Mb

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	BGA 119 (B)	BGA 165 (D)	BGA 165 (E)	BGA 209 (C)	TQFP 100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS864272yy-### GS864236yy-### GS864218yy-###	1M x 72 2M x 36 4M x 18	300/250/200/167	2.3–3.5	2.5/3.3	◐			◐		✔	✔	✔	✔	✔
GS8640E36yy-### GS8640E32yy-### GS8640E18yy-###	2M x 36 2M x 32 4M x 18	300/250/200/167	2.3–3.5	2.5/3.3					●	✔		✔		
GS864036yy-### GS864032yy-### GS864018yy-###	2M x 36 2M x 32 4M x 18	300/250/200/167	2.3–3.5	2.5/3.3					●	✔	✔			
GS864436yy-### GS864418yy-###	2M x 36 4M x 18	250/225/200/166/150/133	2.5–4.0	2.5/3.3			◐			✔	✔	✔	✔	✔
GS864272yy-###V GS864236yy-###V GS864218yy-###V	1M x 72 2M x 36 4M x 18	250/200/167	3.0–3.5	1.8/2.5	◐			◐		✔	✔	✔	✔	✔
GS8640E36yy-###V GS8640E32yy-###V GS8640E18yy-###V	2M x 36 2M x 32 4M x 18	250/200/167	3.0–3.5	1.8/2.5					●	✔		✔		
GS864036yy-###V GS864032yy-###V GS864018yy-###V	2M x 36 2M x 32 4M x 18	250/200/167	3.0–3.5	1.8/2.5					●	✔	✔			
GS864436yy-###V GS864418yy-###V	2M x 36 4M x 18	250/225/200/166/150/133	2.5–4.0	1.8/2.5			◐			✔	✔	✔	✔	✔

36Mb (Rev. A)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	BGA 119 (B)	BGA 165 (D)	BGA 165 (E)	BGA 209 (C)	TQFP 100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS832236Ayy-### GS832218Ayy-###	1M x 36 2M x 18	400/375/333/250/200/150	2.5–3.8	2.5/3.3	◐	◐				✔	✔	✔	✔	✔
GS8321E36Ayy-### GS8321E32Ayy-### GS8321E18Ayy-###	1M x 36 1M x 32 2M x 18	400/375/333/250/200/150	2.5–3.8	2.5/3.3		◐				✔		✔	✔	
GS832136Ayy-### GS832132Ayy-### GS832118Ayy-###	1M x 36 1M x 32 2M x 18	400/375/333/250/200/150	2.5–3.8	2.5/3.3		◐				✔			✔	

Package Notes:
◐ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

Synchronous Burst (SyncBurst™) SRAMs (Continued)

36Mb
(Rev. A—Continued)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS8320E36Ayy-### GS8320E32Ayy-### GS8320E18Ayy-###	1M x 36 1M x 32 2M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					●	✔		✔		
GS832036Ayy-### GS832032Ayy-### GS832018Ayy-###	1M x 36 1M x 32 2M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					●	✔	✔			
GS832236Ayy-###V GS832218Ayy-###V	1M x 36 2M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5	◐	◐				✔	✔	✔	✔	✔
GS8321E36Ayy-###V GS8321E32Ayy-###V GS8321E18Ayy-###V	1M x 36 1M x 32 2M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5		◐				✔		✔	✔	
GS832136Ayy-###V GS832132Ayy-###V GS832118Ayy-###V	1M x 36 1M x 32 2M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5		◐				✔			✔	
GS8320E36Ayy-###V GS8320E32Ayy-###V GS8320E18Ayy-###V	1M x 36 1M x 32 2M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5					●	✔		✔		
GS832036Ayy-###V GS832032Ayy-###V GS832018Ayy-###V	1M x 36 1M x 32 2M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5					●	✔	✔			

36Mb
(Original Rev.)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS832272yy-###	512K x 72	250/225/200/ 166/150/133	2.5–4.0	2.5/3.3				◐		✔	✔	✔	✔	✔
GS832272yy-###V	512K x 72	250/225/200/ 166/150/133	3.0–4.0	1.8/2.5				◐		✔	✔	✔	✔	✔

18Mb
(Rev. D)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS816236Dyy-### GS816218Dyy-###	512K x 36 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3	◐	◐				✔	✔	✔	✔	✔
GS8161E36Dyy-### GS8161E32Dyy-### GS8161E18Dyy-###	512K x 36 512K x 32 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3		◐			●	✔		✔	✔	
GS816136Dyy-### GS816132Dyy-### GS816118Dyy-###	512K x 36 512K x 32 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3		◐			●	✔			✔	

Package Notes:
◐ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
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Synchronous Burst (SyncBurst^{TM}) SRAMs (Continued)

18Mb
(Rev. D—Continued)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS8160E36Dyy-### GS8160E32Dyy-### GS8160E18Dyy-###	512K x 36 512K x 32 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					●	✔		✔		
GS816036Dyy-### GS816032Dyy-### GS816018Dyy-###	512K x 36 512K x 32 1M x 18	400/375/333/ 250/200/150	2.5–3.8	2.5/3.3					●	✔	✔			
GS816236Dyy-###V GS816218Dyy-###V	512K x 36 1M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5	◐	◐				✔	✔	✔	✔	✔
GS8161E36Dyy-###V GS8161E32Dyy-###V GS8161E18Dyy-###V	512K x 36 512K x 32 1M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5		◐			●	✔		✔	✔	
GS816136Dyy-###V GS816132Dyy-###V GS816118Dyy-###V	512K x 36 512K x 32 1M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5		◐			●	✔			✔	
GS8160E36Dyy-###V GS8160E32Dyy-###V GS8160E18Dyy-###V	512K x 36 512K x 32 1M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5					●	✔		✔		
GS816036Dyy-###V GS816032Dyy-###V GS816018Dyy-###V	512K x 36 512K x 32 1M x 18	333/250/200/ 150	3.0–3.8	1.8/2.5					●	✔	✔			

18Mb
(Rev. C)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS816272Cyy-###	256K x 72	333/300/250/ 200/150	2.8–3.8	2.5/3.3				◐		✔	✔	✔	✔	✔
GS816272Cyy-###V	256K x 72	250/200/150	3.0–3.8	1.8/2.5				◐		✔	✔	✔	✔	✔
GS816273Cyy-###	256K x 72	333/300/250	2.3–2.5	2.5/3.3				●		PL Only	✔	✔	✔	✔
GS816273Cyy-###V	256K x 72	250	2.5	1.8/2.5				◐		PL Only	✔	✔	✔	✔

9Mb
(Rev. C)

GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)	FT/PL	SCD	DCD	JTAG	FLXDrive™
GS88236Cyy-### GS88218Cyy-###	256K x 36 512K x 18	333/300/250/ 200/150	2.5–3.8	2.5/3.3	◐	◐				✔	✔	✔	✔	✔
GS881E36Cyy-### GS881E32Cyy-### GS881E18Cyy-###	256K x 36 256K x 32 512K x 18	333/300/250/ 200/150	2.5–3.8	2.5/3.3		◐			●	✔		✔	✔	

Package Notes:
◐ = Available in 6/6 AND 5/6 RoHS-compliant packages.
● = Available ONLY in 6/6 RoHS-compliant packages.
○ = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

Synchronous Burst (SyncBurst^{TM}) SRAMs (Continued)

					Packages					Features				
GSI P/N	**Config**	**Speed (MHz)**	**Pipeline tKQ (ns)**	**V_{DD} V_{DDQ}**	**BGA**				**TQFP**	**FT/PL**	**SCD**	**DCD**	**JTAG**	**FLXDrive™**
					119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)					
GS88136Cyy-### GS88132Cyy-### GS88118Cyy-###	256K x 36 256K x 32 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3		◐			●	✔			✔	
GS880E36Cyy-### GS880E32Cyy-### GS880E18Cyy-###	256K x 36 256K x 32 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3					●	✔		✔		
GS880F36Cyy-### GS880F32Cyy-### GS880F18Cyy-###	256K x 36 256K x 32 512K x 18	4.5/5/5.5/6.5/7.5 (ns)	n/a	2.5/3.3					●	FT Only	✔			
GS88036Cyy-### GS88032Cyy-### GS88018Cyy-###	256K x 36 256K x 32 512K x 18	333/300/250/200/150	2.5–3.8	2.5/3.3					●	✔	✔			
GS88237Cyy-###	256K x 36	333/300/250/200	2.0–2.7	2.5/3.3	◐					PL Only	✔	✔	✔	✔
GS88037Cyy-###	256K x 36	333/300/250/200	2.0–2.7	2.5/3.3					●	PL Only	✔			
GS88236Cyy-###V GS88218Cyy-###V	256K x 36 512K x 18	250/200/150	3.0–3.8	1.8/2.5	◐	◐				✔	✔	✔	✔	✔
GS881E36Cyy-###V GS881E32Cyy-###V GS881E18Cyy-###V	256K x 36 256K x 32 512K x 18	250/200/150	3.0–3.8	1.8/2.5		◐			●	✔		✔	✔	
GS88136Cyy-###V GS88132Cyy-###V GS88118Cyy-###V	256K x 36 256K x 32 512K x 18	250/200/150	3.0–3.8	1.8/2.5		◐			●	✔			✔	
GS880E36Cyy-###V GS880E32Cyy-###V GS880E18Cyy-###V	256K x 36 256K x 32 512K x 18	250/200/150	3.0–3.8	1.8/2.5					●	✔		✔		
GS880F36Cyy-###V GS880F32Cyy-###V GS880F18Cyy-###V	256K x 36 256K x 32 512K x 18	5.5/6.5/7.5 (ns)	n/a	1.8/2.5					●	FT Only	✔			
GS88036Cyy-###V GS88032Cyy-###V GS88018Cyy-###V	256K x 36 256K x 32 512K x 18	250/200/150	3.0–3.8	1.8/2.5					●	✔	✔			
GS88237Cyy-###V	256K x 36	250/200	2.5	1.8/2.5	◐					PL Only	✔	✔	✔	✔
GS88037Cyy-###V	256K x 36	250/200	2.5	1.8/2.5					●	PL Only	✔			

9Mb (Rev. C—Continued)

Synchronous Burst (SyncBurst™) SRAMs (Continued)

4Mb (Rev. C)															
GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	Packages						Features				
					BGA				TQFP						
					119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)		FT/PL	SCD	DCD	JTAG	FLXDrive™
GS84036Cyy-### GS84032Cyy-### GS84018Cyy-###	128K x 36 128K x 32 256K x 18	180/166/150/ 100	3.0–4.5	3.3 2.5/3.3	◑						✔	✔			

4Mb (Rev. A)															
GSI P/N	Config	Speed (MHz)	Pipeline tKQ (ns)	V_{DD} V_{DDQ}	Packages						Features				
					BGA				TQFP						
					119 (B)	165 (D)	165 (E)	209 (C)	100 (GT)		FT/PL	SCD	DCD	JTAG	FLXDrive™
GS840E36Ayy-### GS840E32Ayy-### GS840E18Ayy-###	128K x 36 128K x 32 256K x 18	180/166/150/ 100	3.0–4.5	3.3 2.5/3.3					●		✔		✔		
GS840F36Ayy-### GS840F32Ayy-### GS840F18Ayy-###	128K x 36 128K x 32 256K x 18	8/8.5/10/12 (ns)	n/a	3.3 2.5/3.3					●		FT Only			✔	
GS84036Ayy-### GS84032Ayy-### GS84018Ayy-###	128K x 36 128K x 32 256K x 18	180/166/150/ 100	3.0–4.5	3.3 2.5/3.3					●		✔	✔			

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
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Asynchronous SRAMs

8Mb (2-Die Module)

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS78108Ayy-###	1M x 8	8, 10, 12	3.3 V		◐			NOW
GS78116Ayy-###	512K x 16	8, 10, 12	3.3 V		◐			NOW
GS78132Ayy-###	256K x 32	8, 10, 12	3.3 V		◐			NOW

6Mb (2-Die Module)

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS76024Ayy-###	256K x 24	8, 10, 12	3.3 V		◐			NOW

4Mb

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS74104Ayy-###	1M x 4	8, 10, 12	3.3 V	●				NOW
GS74108Ayy-###	512K x 8	8, 10, 12	3.3 V	●			◐	NOW
GS74116Ayy-###	256K x 16	8, 10, 12	3.3 V	●			◐	NOW
GS74117Ayy-###	256K x 16	8, 10, 12	3.3 V				◐	NOW

3Mb (2-Die Module)

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS73024Ayy-###	128K x 24	8, 10, 12	3.3 V		◐			NOW

2Mb

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS72108Ayy-###	256K x 8	7, 8, 10, 12	3.3 V	●				NOW
GS72116Ayy-###	128K x 16	7, 8, 10, 12	3.3 V	●		◐		NOW

1Mb

GSI P/N	Config	Access Time (ns)	Voltage	TSOP-II	119 BGA	6 x 8 mm FPBGA	6 x 10 mm FPBGA	Avail.
GS71108Ayy-###	128K x 8	7, 8, 10, 12	3.3 V	●		◐		NOW
GS71116Ayy-###	64K x 16	7, 8, 10, 12	3.3 V	●		◐		NOW

Package Notes:
◐ = Available in 6/6 AND 5/6 RoHS-compliant packages.

● = Available ONLY in 6/6 RoHS-compliant packages.

● = Available ONLY in 5/6 RoHS-compliant packages.

Part Number Notes:
yy = Package Designator; ### = Speed Bin Designator

All parts are available in Commercial and Industrial temperature options.
Contact your sales representative for Extended or Military temperature option parts.

GSI   /QQ
GS P DDD O FF WWW R KK - BBB T C S

P = Product Line Code
(1 digit)
4 = LLDRAM
8 = Sync SRAM
7 = Async SRAM

DDD = Density / Product Family
(Up to 3 digits)
0 = 256K
1 = 1Mb
2 = 2Mb
3 = 3Mb
4 = 4 or 4.5Mb
6 = 6Mb
8 = 8 or 9Mb
16, 17, 18 = 16 or 18Mb
32, 33, 34 = 32 or 36Mb
64, 65, 66, 67 = 64 or 72Mb
128, 129, 130, 131 = 128 or 144Mb
256, 257, 258 = 256 or 288Mb
288 = 288Mb
576 = 576Mb
300~309 = 1 or 1.125 or 1.25Gb
310~319 = 2 or 2.25 or 2.5Gb
320~329 = 4 or 4.5 or 5Gb
330~339 = 8 or 9 or 10Gb
340~349 = 16 or 18 or 20Gb

O = Option
(Up to 1 alpha)
(Specific meaning varies by product family)
X = Non-catalog Assembly Option

Note: If "X" is shown in the Option Code field, the Function Code and Speed Bin fields become general purpose alphanumeric custom part number fields.

FF = Function Code
(Up to 2 alpha)

SRAM Codes
DD = Double Data Rate (DDR)
DW = Double Late Write
E = Dual Cycle Deselect (DCD)
F = Flow Through Only
H = High Drive Output
L = Low Drive Output
LW = Late Write
Z = No Bus Turnaround

SigmaQuad/DDR Codes
D = SigmaQuad/II/II+/IIIe/IVe B4
DV = SigmaQuad B4 2.5V
DT = SigmaQuad-II+ B4 ODT
E = LV (1.2V) and HV (1.5V) HSTL
H = HV (1.5 V) HSTL
L = LV (1.2 V) HSTL
P = POD
Q = SigmaQuad/II/II+/IIIe/IVe B2
QV = SigmaQuad B2 2.5V
QT = SigmaQuad-II+ B2 ODT
R = SigmaDDR-II B4
S = SigmaSIO DDR-II
T= SigmaDDR/II/II+/IIIe/IVe B2
TT = SigmaDDR-II+ B2 ODT

LLDRAM Codes
C = Common I/O
R = Common I/O B4
RH = Common I/O B4 HSTL
S = Separate I/O
T = Common I/O B2
TH = Common I/O B2 HSTL

WWW = I/O Width/Variation
(Up to 3 digits)
1 = x1
4 = x4
8 = x8
16 = x16
18, 19 = x18
20 = x18 or x20
24 = x24
32 = x32
36, 37, 38 = x36
40 = x36 or x40
72, 73 = x72

R = Revision Level
(Up to 1 alpha)
Blank = Original Mask Set
A = 2nd Generation
B = 3rd Generation
C = 4th Generation

KK = Package
(Up to 2 alpha)
B = 14 mm x 22 mm, 119 BGA
C = 14 mm x 22 mm, 209 FPBGA
D = 13 mm x 15 mm, 165 FPBGA
E = 15 mm x 17 mm, 165 FPBGA
H = 15 mm x 17 mm, 165 FPBGA NSMD
J = 400 mil SOJ
K = 14 mm x 22 mm, 260 BGA
L = 11 mm x 18.5 mm, 144 µBGA
N = 14 mm x 18.5 mm 180 µBGA
Q = QFP
SJ = 300 mil SOJ
T = TQFP
TP = TSOP-II
TS = TSOP-I
U = 6 mm x 8 mm, 48 FPBGA
X = 6 mm x 10 mm, 48 FPBGA
Z = 15 mm x 17 mm, 165 FPBGA (FC)
GB = Green 14 mm x 22 mm, 119 BGA
GC = Green 14 mm x 22 mm, 209 FPBGA
GD = Green 13 mm x 15 mm, 165 FPBGA
GE = Green 15 mm x 17 mm, 165 FPBGA
GJ = Green 400 mil SOJ
GK = Green 14 mm x 22 mm, 260 BGA
GL = Green 11 mm x 18.5 mm, 144 µBGA
GN = Green 14 mm x 18.5 mm 180 µBGA
GQ = Green QFP
GT = Green TQFP
GP = Green TSOP-II
GS = Green TSOP-I
GU = Green 6 mm x 8 mm, 48 FPBGA
GX = Green 6 mm x 10 mm, 48 FPBGA
GZ = Green 15 mm x 17 mm, 165 FPBGA (FC)
HK = 5/6 RoHS-compliant 260 BGA with Pb-free
     exterior balls

BBB = Speed Bin
(Up to 3 digits)
XX = ns or MHz

T = Temp Grade
(Up to 1 alpha)
Blank = Commercial (0º to 70ºC)
I = Industrial (–40º to 85ºC)
E = Extended (–40º to 125ºC)
M = Military (–55º to 125ºC)

C = Customization
V = Voltage Variation
X = Non-catalog Post-assembly Option

Note: If "X" is shown in the Customization field, the Speed Bin field may become a general purpose alphanumeric custom part number field.

S = Shipping Optionl
(Up to 1 alpha)
Blank = Bulk
T = Tape and Reel

QQ = Qualification Status
(Up to 1 symbol and 2 alpha)
Blank = Pre-Qual or Qualified
/ES = Eng Sample*

*Note: The /ES mark may appear anywhere on the top surface of the package. The /ES mark supersedes any other qualification status mark that may appear on the device.

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