GSI Technology

Memory Controller IP Frequently Asked Questions

- **What is this memory controller?**

  The memory controller is a Verilog module that can be loaded into FPGAs for best-in-class memory subsystem performance. It is designed for use with GSI's SigmaQuad^{TM} and SigmaDDR^{TM} technology.

- **What types of memories can be used with this controller?**

  GSI offers this controller IP to any customer that includes SigmaQuad-IIIe^{TM}, SigmaDDR-IIIe^{TM}, SigmaQuad-II+^{TM}, or SigmaDDR-II+^{TM} SRAMs in their design. Additional details on these devices can be found here: : http://www.gsitechnology.com/ip-port.

- **What types of host chips can be used?**

  Our current IP Ports are designed to work with Xilinx Series 7, Virtex-6, and Altera Stratix V FPGAs. IP Ports for use with Xilinx UltraScale Series and Altera Arria 10 are forthcoming.

- **What level of performance is possible?**

  GSI has validated the controller with SRAM clock speeds of up to 725 MHz. This means that SigmaQuad-IIIe^{TM} SRAMs, with two transactions per second capabilities, can execute up to 1.45 billion transactions per second.

FPGA Family/ Speed Grade	IP Mux Setting	SRAM Clock Speed
Virtex-6/-3	2:1	(IIIe ONLY) 500 MHz (x18), 450 MHz (x36)
Virtex-7/-3 Kinex-7/-3	2:1	(IIIe and II+) 600 MHz
	4:1	(IIIe) 725 MHz (x18), 700 MHz (x36) (II+) 700 MHz
Stratix-V/-1	2:1	~725 MHz

- **How is this level of performance achieved?**

    The controller performs per-pin timing training on all DDR signal connections between the FPGA and SRAMs. The training compensates for any pin-to-pin skew.

- **What developer's resources are available?**

    User's guides are provided for the software development kit and the controller IP along with the IP source code, simulation model, and design constrain file.

- **How much does the IP cost?**

    GSI controller IP is provided <u>free of charge</u> to qualified customers. Usage is limited to designs which use GSI's SigmaQuad-IIIe^{TM}, SigmaDDR-IIIe^{TM}, SigmaQuad-II+^{TM}, or SigmaDDR-II+^{TM} SRAMs.

- **How do I contact GSI for additional information?**

    Initial inquiries: apps@gsitechnology.com

    Features, downloads, documentation: apps@gsitechnology.com

    Installation and debugging: apps@gsitechnology.com