SpeedBridge Adapter for SATA

Rapid system-level verification deployment

The Cadence® SpeedBridge® Adapters provide protocol interface solutions for an emulation platform that enables the efficient driver and application-level testing, targeting validation of pre-silicon RTL of ASICs and systems on chip (SoCs) with a Cadence Palladium® emulation system or Cadence Protium™ prototyping system. SpeedBridge Adapters can also be leveraged to quickly and easily reproduce post-silicon bugs. The solution enables verification of emulated designs along with development, testing, and performance characterization of embedded software, system-level drivers, and final software applications.

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As SoC designs continue to increase in size and complexity, verification becomes increasingly time-consuming. Acceleration and emulation enable more comprehensive validation of a design than with simulation alone, and they allow engineers to develop firmware, device drivers, and software before final silicon availability.

Cadence provides a powerful system-level emulation solution for Serial ATA (SATA). The SpeedBridge Adapter for SATA interfaces with most existing SATA-capable hosts or disks without requiring modification. It performs rate adaptation so that emulated SATA designs can connect to full-speed devices (SATA host or SATA disk) without slowing them to emulation speed (see Figure 1).

The SATA environment consists of two components: the host controller, residing in the PC or consumer device, and a disk controller, residing in the disk drive. The SpeedBridge Adapter for SATA connects directly to a Cadence emulator through standard emulation cables. It is designed to be functionally transparent to both the emulated designs and the target device.

Figure 1: The SpeedBridge Adapter for SATA helps connect a Cadence emulation system to a full-speed disk drive or controller.
With the high speed of Cadence in-circuit emulation, the engineer can co-verify system hardware and software together with software drivers without the real silicon. Cadence emulators, such as the Palladium system, provide hardware and software debug technologies for ease of use, ease of debugging, and high speed.

The SpeedBridge Adapter for SATA comes in three product configurations: 39BSATAP, which allows the host design to connect to a full-speed SATA disk drive; 39BSATALP, a high-speed disk-access version that allows users a high-speed SATA connection to access internal disk drives; and 39BSATAHD, which allows an emulated SATA disk design to connect to a full-speed SATA host controller.

Benefits

- Enables rapid emulation deployment
- Enables IP reuse
  - Can be used in multiple projects
  - Eliminates the need for every user to re-invent the solution
  - Improves productivity to get to the first test by eliminating the need to set up a complex FPGA-based environment
- Ensures quality
  - Provides a single-card solution
  - Tested and verified by Cadence and many other user designs
  - Verifies designs quickly and efficiently
- Reduces system risk
  - Checks SATA protocol and integrity errors
  - Verifies the SATA design in a real environment
  - Boots the operating system
  - Runs real system software/drivers
  - Performs disk discovery
  - Provides a high level of confidence in the SATA device’s quality
  - Reduces time to market

Features

- Supports any one of the following configurations:
  - **39BSATAP**: Two connections to full-speed disk drives (one installed on the SpeedBridge Adapter)
  - **39BSATAHD**: Two connections to full-speed host controllers
  - **39BSATALP**: Connections to one host controller and one disk drive
- Supports 1.5Gbps (150MBps), 3.0Gbps (300MBps), and 6.0Gbps (600MBps) on the emulation interface of the DUT
- Emulation speeds
  - Connects an emulated SATA host controller to a full-speed SATA disk drive or an emulated disk controller to a full-speed SATA host controller
  - Works with emulation speeds up to 2MHz
- Completely transparent to software driver
- Comprehensive debug
  - Fully static implementation supports key emulation debug features
- Supports Native Command Queuing (NCQ)
- Supports high-speed loopback mode that lets customers configure the full-speed disk from a standard PC before running the emulated design or retrieve data from disk after running the emulated design
- Provides an efficient way to connect to large drives
- Provides comprehensive support for SATA command sets
- Fully supports remote operation e analog/mixed-signal full-chip verification

Specifications

- SATA 3.0 compliant
- Supports the SAPIS interface as well as other variations

Requirements

- One Cadence SpeedBridge Adapter for up to two emulated host controllers or SATA disk drives
- Cadence Palladium emulator
- Universal SpeedBridge chassis
- Device driver and/or application software required by the emulated ASIC
Cadence Services and Support

- Cadence application engineers can answer your technical questions by telephone, email, or internet—they can also provide technical assistance and custom training.

- Cadence-certified instructors teach more than 70 courses and bring their real-world experience into the classroom.

- More than 25 Internet Learning Series (ILS) online courses allow you the flexibility of training at your own computer via the internet.

- Cadence Online Support gives you 24x7 online access to a knowledgebase of the latest solutions, technical documentation, software downloads, and more.

- For more information, please visit www.cadence.com/support for support and www.cadence.com/training for training.