



CEVA-SATA IP Portfolio

Highlights

- › Host and Device IP solutions for SATA 2.6 and SATA 3.0
- › Controller and Phy IP licensable as separate IP packages
- › Flexible Phy Control Layer in Controller IP for integrating with industry leading 3Gbps and 6Gbps serdes solutions, such as Snowbush serdes IP
- › Proprietary processor-offload features within Controller IP to increase performance while reducing real-time software loading.
- › Full support for latest NCQ modes
- › Low Power Slumber Phy for Device applications

Introduction

As a leading provider of Serial ATA IP since 2003, CEVA has a strong pedigree in licensing and supporting this specialist technology.

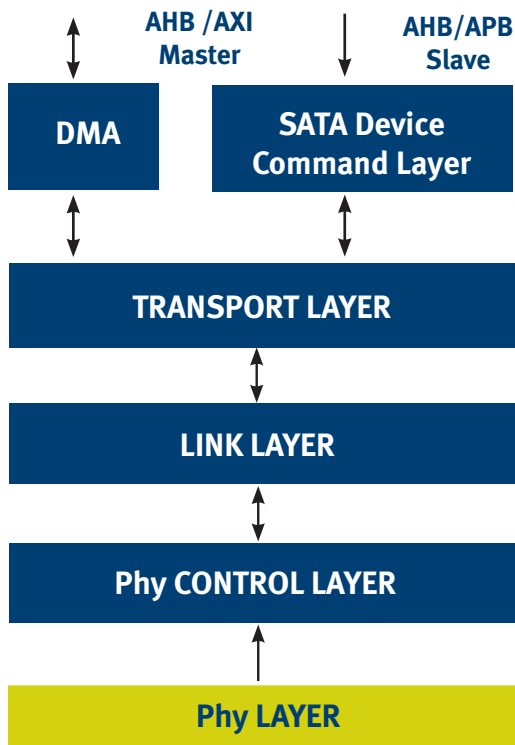
CEVA offers optimized solutions for both Host-end and Device-end, for SATA 2.6 (i.e. 3Gbps) and for SATA 3.0 (i.e. 6Gbps). The Controller IP (licensed as an RTL IP package) may be bundled with the Phy IP (licensed as a GDSII IP package) or either IP package may be licensed separately.

Further, the CEVA-SATA Controller IP is supplied with a flexible Phy Control Layer to facilitate integration with alternative 3Gbps or 6Gbps Phy/serdes technology, such as in-house Phys, leading 3rd party Phys, e.g. Snowbush Phy IP and the embedded serdes functions inside the Virtex V/VI Xilinx FPGAs and Altera Stratix IV FPGAs.

Suitable for deployment in ASICs, ASSPs and FPGAs, the CEVA-SATA IP is silicon proven and in production with multiple licensees, in diverse applications such as SSDs for Device-end and Set-Top-Box/DVR for Host-end.

CEVA-SATA Device Controller IP

At the Device end, CEVA's extensive experience with SSD licensees has resulted in a CEVA-SATA Device Controller IP solution with features particularly attractive to high performance and power sensitive applications. The optimised Device Command Layer provides hardware off-load for the embedded processor which maximises performance while maintaining system flexibility. The CEVA-SATA Device Controller IP supports the latest SATA3.0 specification for 6Gbps operation.



Target Markets

- > SSD
- > Blu-Ray and other optical storage devices

Key Features

- > For **SATA 2.6 (3Gbps)** and **SATA 3.0 (6Gbps)**
- > **Optimised Device Command Layer with hardware accelerated functions**
- > **AMBA AXI/AHB bus interface**
- > **Scatter/Gather DMA**
- > **PIO / DMA / FPDMA Data Transfers**
 - Complete & Partial Data Transfers
 - Automated segmentation and assembly
- > **NCQ Acceleration hardware**
 - Offload the functions of command queuing and completion
 - Automatic generation of 'Acknowledge FIS' when accepting Commands to queue
 - Maintains Command arrival order
 - Programmable Command Completion coalescing
 - Capable of storing 32 queued commands
- > **Enhanced NCQ hardware for Isochronous data transfers for SATA3.0**
 - Normal, ICC, High Priority, Immediate commands tagged
 - Hardware implemented ICC timers and Queue Management
 - "Most Urgent" timer list maintained in hardware
 - "Expired Commands" list maintained in hardware

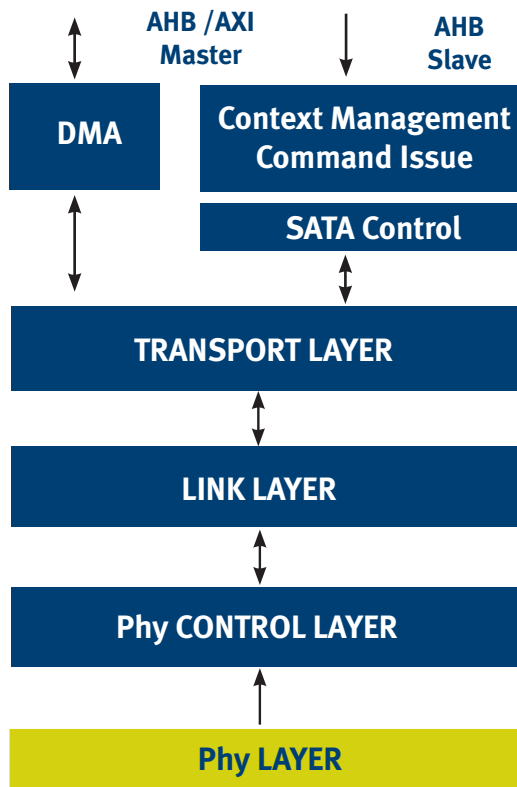
Deliverables

- > Verilog RTL Source Code
- > Testbench including AMBA and Host /Device transactors
- > Test Environment User's Guide
- > Example scripts for Synthesis, STA, LEC
- > Synthesis Guidelines Document
- > Datasheet
- > Example Software drivers
- > FPGA-based Development System emulating simple SSD

CEVA-SATA Host Controller IP

For basic SATA Host applications, the CEVA-SATA Consumer Host Controller IP offers a simple ATA Task file register interface for ease of programming.

For more demanding applications, such as an enterprise environment requiring high reliability and performance, or a high performance consumer environment such as a Set-Top-Box/Digital Video Recorder, the CEVA-SATA Enterprise Host Controller IP offers a robust and powerful “fire&forget” command processing engine to the embedded software, and hence substantially off-loads the embedded processor. The CEVA-SATA Enterprise Host Controller IP supports the latest SATA3.0 specification for 6Gbps operation.



Target Markets

- › Set-Top-Box / Digital Video Recorders
- › Media Gateway Servers
- › Netbooks / Tablet PC
- › RAID Controllers
- › Surveillance Controllers

Key Features

- › For SATA 2.6 (3Gbps) and SATA 3.0 (6Gbps)
- › Command Layer with processor off-load
 - “Fire&Forget” command servicing engine, with Descriptor-type command processing
 - Supports Isochronous data transfers (for video streaming)
 - Hardware implemented features to off-load processor
- › Augmented by Scatter/Gather DMA
- › AMBA AXI/AHB bus interface
- › Hardware support for
 - NCQ
 - Port Multiplier, Port Selector
 - FIS based switching
 - First Party Queued DMA (FPDMA)
 - Interrupt coalescing on command Completion
 - Posted / non-posted memory transactions
 - Data Path Protection
 - Fully programmable FIS Content

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- › Example Software drivers
- › FPGA-based Development System emulating simple Host HBA

CEVA-SATA Phy IP

The CEVA-SATA 3.0Gbps Phy IP provides a complete SATA Phy function, as per the SATA 2.6 specification, incorporating both Serdes and PCS..

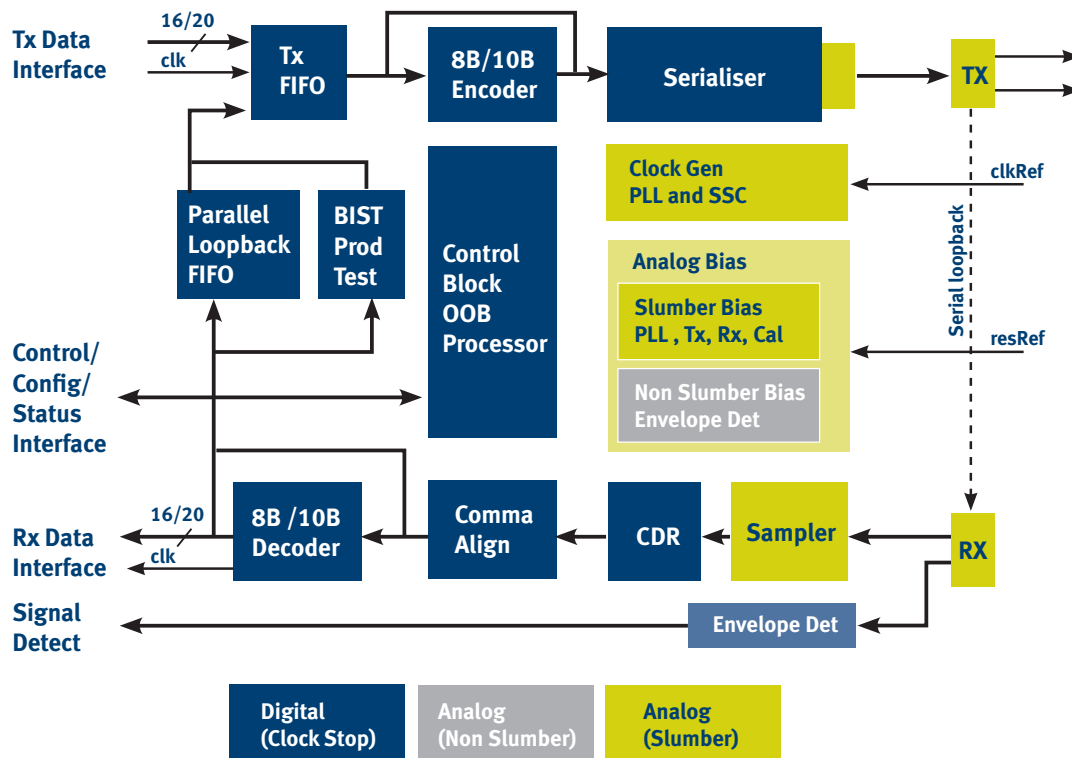
Supporting both Host and Device end applications, it is designed for both SATA 'i' and SATA 'm' specification, the later being applicable for eSATA.

With built-in spread spectrum clock generation, full OOB processing, 8b/10b encoding and decoding and a very low power slumber mode, the CEVA-SATA Phy is a comprehensive SATA Phy entity which is silicon proven for 3Gbps operation against the SATA Inter-operability specification version 1.3.

For flexibility in SoC integration, the CEVA-SATA Phy can be provided with different bonding options including Circuit-Under-Pad (CUP), and deployed with various metal layer options.

Key Features

- > For SATA 2.6 (3Gbps)
- > Silicon proven and in volume production
- > Supports Host and Device side
- > Supports SATA 'i' & 'm' spec
 - Supports eSATA
- > Very low power slumber mode
- > Various Bonding / Metal Layer options
 - Circuit-Under-Pad (7 – 9 Layer Metal)
 - Standard Wirebond (6 – 9 Layer Metal)
- > TSMC Universal IO Compatible
- > Delivered as GDSII IP package



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