

FEATURES

■ General

- Fully compatible with the ATAPI Specification SFF-8020, Revision 1.2
- All ATAPI commands supported
- Supports generic 8-bit CD-ROM decoders
- Compatible with existing ATA drive hardware connections and drivers
- Interfaces to external:
 - CD-ROM decoder
 - SRAM buffer memory (optional)
 - Microprocessor
 - ATAPI bus
- Designed for easy and efficient firmware programming
- Low-power CMOS technology
- Automatic power-down mode
- 100-pin PQFP package

■ ATAPI Interface

- True realtime hardware/software ATAPI compatibility
- Hardware implementation of:
 - ATAPI packet command
 - ATAPI reset command
- Automated protocol control on block data transfers for ATAPI read/write commands
- Direct interface to ATAPI bus with programmable 12-mA or 24-mA drivers
- Supports any host speed with programmable and auto wait-state generation

(cont.)

ATAPI (ATA Packet Interface) CD-ROM Controller

OVERVIEW

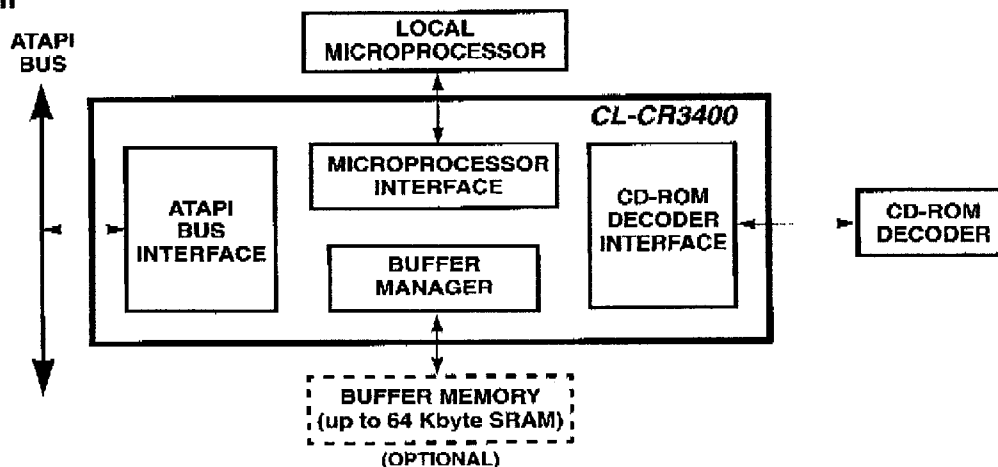
ATAPI (AT Attachment Packet Interface) was developed by the ATA Small Form Factor Committee to provide an inexpensive method for interfacing a CD-ROM drive to an ATA host computer without the need for a separate host adapter. ATAPI is an extension of the standard IDE/ATA interface, which permits a CD-ROM to share the ATA bus of the host computer with existing ATA hard disk drives.

The CL-CR3400 is Cirrus Logic's high-performance ATAPI CD-ROM interface controller. The device is fully compatible with the latest ATAPI specification and provides the hardware necessary to interface between the ATAPI bus and a generic 8-bit CD-ROM decoder. It is typically configured with SRAM buffer memory and a microprocessor (with system RAM and ROM) to create a complete, intelligent ATAPI CD-ROM controller circuit.

The CL-CR3400 design combines a dual-port buffer memory manager, a high-speed CD-ROM decoder

(cont.)

Functional Block Diagram



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FEATURES (cont.)

■ ATAPI Interface (cont.)

- Supports ATA PIO Mode 3 transfer to and from buffer memory (transfer rates up to 12.0 Mbytes per second)
- Demand mode DMA handshake logic (EISA Type 'B')
- FIFOs synchronize buffer RAM access with host bus and CD-ROM decoder data transfer
- Provision for daisy-chaining two ATA or ATAPI embedded drives

■ CD-ROM Decoder Interface

- Supports generic 8-bit CD-ROM decoders
- User-programmable data transfer rate
- Time-out detection for data transfer handshake

■ High-Performance

- PIO/DMA ATAPI bus transfer rate:
12.0 Mbytes per second
- CD-ROM data transfer rate:
5.5 Mbytes per second at 40 MHz SYSCLK
4.8 Mbytes per second at 33-MHz SYSCLK
- Buffer bandwidth:
12.0 Mbytes per second

■ Buffer Manager

- Direct addressing of up to 64 Kbytes of SRAM with fixed and variable buffer segmentation
- Bypass mode
 - Bufferless applications
 - Microprocessor disables buffer manager
 - Direct ATAPI host to CD-ROM decoder interface connection
- Dual-port circular buffer control with access priority resolver
- Scheduled- or direct-microprocessor access to buffer
- Buffer clock can be internally divided by 1, 2, 3, or 4
- Host overrun control
- Dual buffer chip enables for two separate 32-Kbyte SRAM buffers

■ Microprocessor Interface

- Supports high-speed Intel®-type microprocessors
- Interrupt- or polled-microprocessor interface
- Microprocessor access to eight external switch settings on the buffer bus
- Interface power-down when idle, automatic power-up when command received

OVERVIEW (cont.)

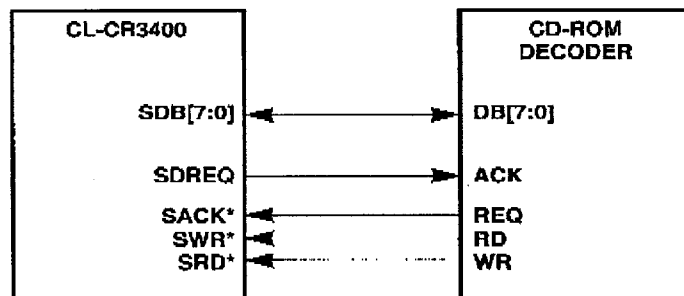
interface, a microprocessor interface, and a direct interface to the ATAPI bus. It has separate, non-multiplexed Intel®-type microprocessor address and data buses; its ATAPI bus drivers are programmable for either 12 mA or 24 mA, providing the flexibility to adapt to different system requirements.

The CL-CR3400 automatically performs in hardware both the ATAPI packet and ATAPI reset commands, improving overall system performance and minimizing the amount of firmware required to implement these commands.

The CL-CR3400 memory manager will control up to 64 Kbytes of static RAM (SRAM) buffers. It supports CD-ROM

decoder data transfer rates up to 5.5 Mbytes per second at 40-MHz SYSCLK (4.8 Mbytes per second at 33-MHz SYSCLK), and provides handshaking for programmed I/O or DMA data transfers on the ATAPI bus at rates up to 12.0 Mbytes per second. Use of a buffer memory is optional. The CL-CR3400 can be operated in a 'bypass' mode where no buffer memory is used and the device allows a direct connection between the ATAPI interface and the CD-ROM decoder device.

CD-ROM Decoder Data Transfer



ADVANTAGES

Unique Features

- Fully compatible with the SFF-8020, Revision 1.2 ATAPI Specification
- Automated ATAPI packet and reset commands
- Dual buffer chip enables
- Can be configured to operate without buffer memory
- ATAPI bus transfer rates up to 12.0 Mbytes per second and buffer bandwidth up to 12.0 Mbytes per second
- Programmable 12-mA or 24-mA ATAPI bus drivers

Benefits

- All ATAPI commands supported
- Improved system performance, lower firmware overhead
- Allows use of separate 32-Kbyte SRAM buffers
- Allows for low-cost implementations
- Ideal for high-performance applications
- Flexibility to adapt to different system requirements

System Block Diagram

