CIRRUS LOGIC®

CL-CR3400

Product Bulletin

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

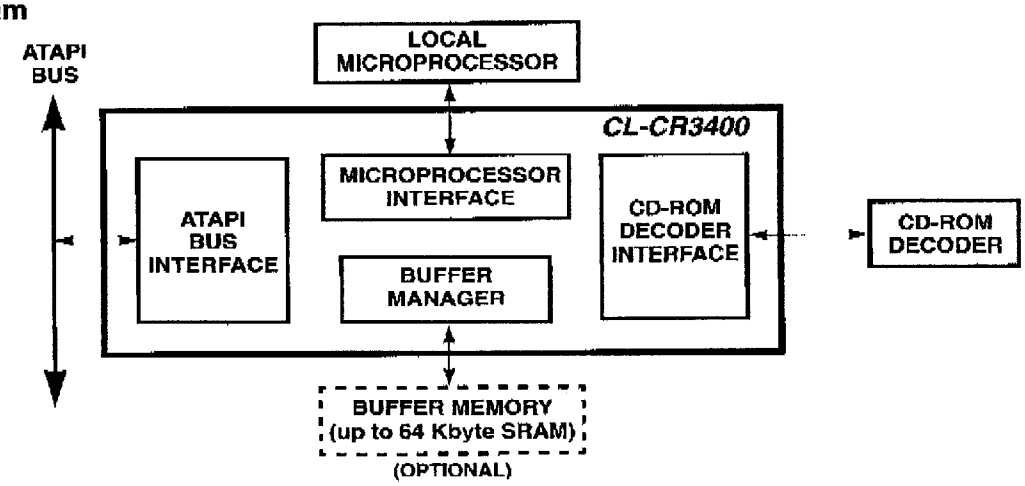
ATAPI (AT Attachment Packet Interface) was developed by the ATA Small Form Factor Committee to provide an inexpensive method for interfacing a CD-ROM drive to an ATA host computer without the need for a separate host adapter. ATAPI is an extension of the standard IDE/ATA interface, which permits a CD-ROM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



September 1994

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

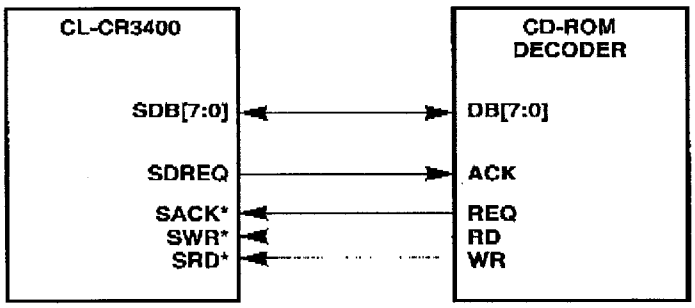
OVERVIEW (cont.)

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



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ADVANTAGES

Unique Features	*Benefits*
■ Fully compatible with the SFF-8020, Revision 1.2 ATAPI Specification	❒ All ATAPI commands supported
■ Automated ATAPI packet and reset commands	❒ Improved system performance, lower firmware overhead
■ Dual buffer chip enables	❒ Allows use of separate 32-Kbyte SRAM buffers
■ Can be configured to operate without buffer memory	❒ Allows for low-cost implementations
■ ATAPI bus transfer rates up to 12.0 Mbytes per second and buffer bandwidth up to 12.0 Mbytes per second	❒ Ideal for high-performance applications
■ Programmable 12-mA or 24-mA ATAPI bus drivers	❒ Flexibility to adapt to different system requirements

System Block Diagram