



Advance Product Bulletin

FEATURES (cont.)

- Supports 8- and 16-bit data transfers on the host bus
- Supports any host speed with programmable and auto-wait-state generation
- AT master/slave protocol

Disk Controller Features

- Fully hardware- and software-compatible with PC XT/AT computers in ATA Mode
- Single- and double-bit NRZ rates of 36 and 48 Mbits/second, respectively, at 5.0 volts, 30 and 40 Mbits/second at 3.3 volts
- Operates in the range of 3.3 to 5.0 volts V_{DD} ($\pm 10\%$)
- Split-voltage operation enables the host interface to function at a different voltage level than the voltage level for the disk, buffer, and local processor interfaces
- Reed-Solomon error correction code (ECC) with 11- or 14-bit automatic 'on-the-fly' hardware correction

- Multi-level power management capability
- Split-data-field operation for constant density recording formats
- Programmable buffer segments for user-defined caching, read look-ahead, etc.
- Auto-write buffer pointer
- Easy-to-modify RAM-based disk formatter control store (31 x 4 bytes)
- Full-track multi-sector transfer capability without local processor intervention
- Support for multiplexed and non-multiplexed address and data bus microcontroller interfaces
- Direct buffer memory addressing of up to 64K bytes of SRAM
- 120-pin VQFP package

OVERVIEW (cont.)

management flexibility, the controller supports split-voltage operation, that enables the host interface to function at a different voltage level than the voltage level of the disk, buffer, and local processor interfaces. Multi-levels of hardware-and firmware-controlled power-down modes reduce power consumption to leakage current, making the CL-SH380 ideal for portable and power-sensitive applications.

The CL-SH380 Disk Formatter consists of a serializer/deserializer, a flexible RAM-based Sequencer, and CRC/ECC generation circuitry. To ensure data integrity and maintain performance, the CL-SH380 performs enhanced 11- or 14-bit-burst 'on-the-fly' Reed-Solomon error correction, while transferring disk data at a continuous 36 Mbits/second using single-bit NRZ or 48 Mbits/second using double-bit NRZ (at 5.0 volts). The industry-standard 16-bit CRC-CCITT for ID fields and proprietary 88-bit Reed-Solomon ECC polynomial for data fields are supported in hardware and require no local microprocessor intervention. A proprietary

split-data-field technique optimizes disk capacity, enables faster access times, and increases data rates. The CL-SH380 Buffer Manager controls up to 64K bytes of SRAM buffer memory as a dual-port circular buffer. It supports a full-track multi-sector data transfer without microprocessor intervention, allowing creation of low-cost, single-processor disk drive designs. It also allows buffer memory segmentation for user-defined caching algorithms or protected-memory areas.

The CL-SH380 works with a local microcontroller and supports both multiplexed address and data bus architecture, similar to the Intel® 8051 family and Motorola® 68HC11 microcontrollers, as well as non-multiplexed bus processor architectures. Also provided is a READY Signal interface for high-speed microcontrollers. It supports both interrupt and polled processor interfaces. The maskable interrupts include many disk and host interface events. The CL-SH380 also has hardware to speed microcontroller access to the buffer memory.

ADVANTAGES

Unique Features

- Full PCMCIA Release 2.0 and PCMCIA-ATA compatibility
- Supports both ATA and PCMCIA-ATA standards with automatic ATA or PCMCIA environment sensing
- 3.3 or 5.0 volt operation with split voltage capability and dynamic switching between 3.3 and 5.0 volts
- Multiple levels of power management
- Disk data rates of up to 48 Mbits/second
- Reed Solomon 'on-the-fly' error correction
- Multi-sector data transfer
- Proprietary split-data-field support

Benefits

Ensures compatibility with software and hardware industry standard for the PCMCIA interface.

Allows interchange between PCMCIA and ATA systems.

Flexibility in designing systems with single or double voltage requirements as well as conformance to PCMCIA voltage requirements.

Reduces power consumption to leakage current.

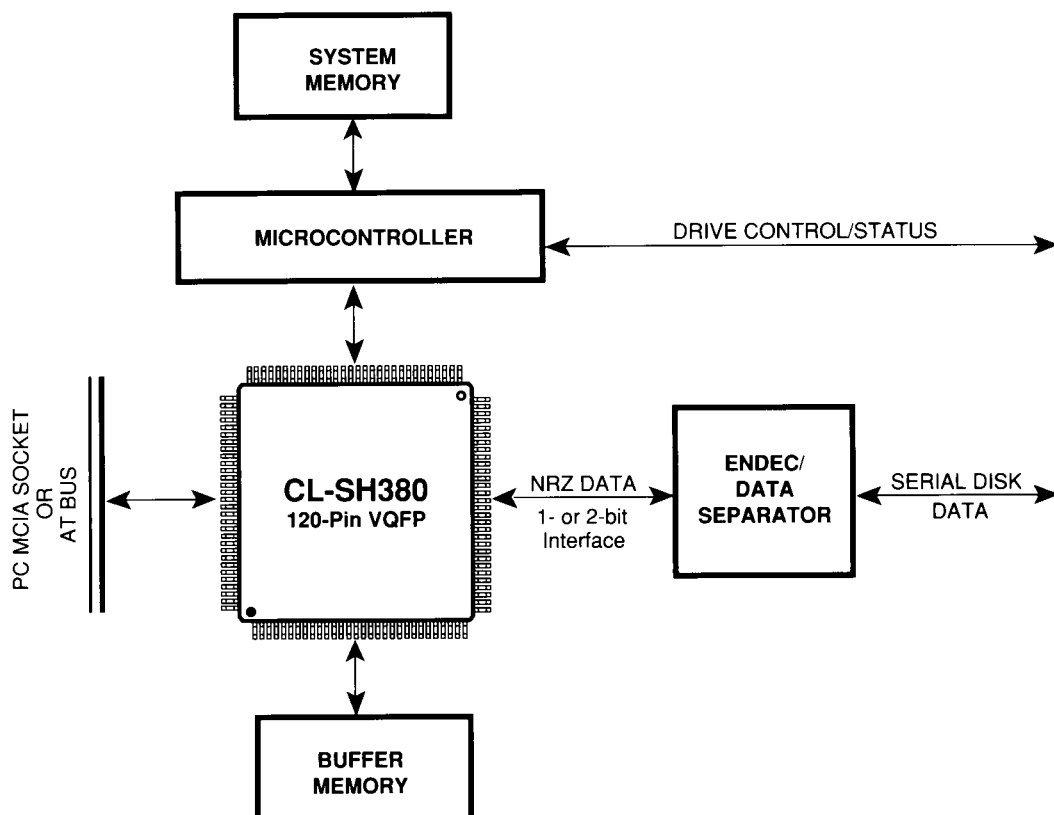
Ideal for high-performance disk drive applications.

Supports true 'on-the-fly' error correction during full-speed data reads.

Reduces real-time processing demand on the local disk drive microcontroller, allowing creation of lower-cost, single-processor disk-drive designs.

Optimizes disk capacity, enables faster access times and data rates.

System Block Diagram



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The Company

Cirrus Logic, Inc., produces high-integration peripheral controller circuits for mass storage, graphics, and data communications. Our products are used in leading-edge personal computers, engineering workstations, and office automation equipment.

The Cirrus Logic formula combines proprietary S/LA™+ IC design automation with system design expertise. The S/LA design system is a proven tool for developing high-performance logic circuits in half the time of most semiconductor companies. The results are better VLSI products, on-time, that help you win in the marketplace.

Cirrus Logic's fabless manufacturing strategy, unique in the semiconductor industry, employs a full manufacturing infrastructure to ensure maximum product quality, availability and value for our customers.

Talk to our systems and applications specialists; see how you can benefit from a new kind of semiconductor company.

† U.S. Patent No. 4,293,783

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