CIRRUS LOGIC®

3CI Integrated HDD Solution

Mass Storage
CL-SH8665

New Open-Processor Platform Enables Cost-Effective, System-on-a-Chip Solutions for Hard Disk Drives

Cirrus Logic's 3CI (read channel, disk controller, microcontroller integration) platform is a highly integrated, open-processor solution that provides manufacturers of next-generation HDDs (hard disk drives) with an unprecedented combination of benefits: reduced cost and power consumption with industry-leading performance and capacity. These critical benefits make the 3CI platform ideal for performance-driven desktop HDD designs as well as cost-sensitive sub-$1,000 and mobile PC applications.

The 3CI platform leverages Cirrus Logic's expertise in mixed-signal design and storage-specific algorithms to provide, on a single chip, critical HDD functions that previously required up to five separate components: PRML a (partial-response-maximum-likelihood) read channel for reliable data acquisition; an Ultra DMA33 disk controller for high-speed data transfers; and an ARM® 32-bit RISC processor core that handles both system and servo control functions and incorporates program memory. Creating a complete HDD design around the 3CI chip requires only the addition of a pre-amp, motor drivers, and buffer memory.

Cirrus Logic enables OEM product differentiation by optimizing the 3CI architecture to easily incorporate the manufacturer's intellectual property, using a top-down design methodology for integrating large functional blocks, such as disk controller or servo logic, onto a single piece of silicon.

Integration and Innovation from ARM Ltd.

The innovative open-processor architecture provided by the ARM-based solution provides manufacturers with an open programming environment and flexibility in choice of semiconductor suppliers. By adopting this open programming environment, OEMs can, over time, drastically reduce their considerable investment in processor firmware and shorten their time to market.

In addition to providing the performance needed for both the micro-controller and servo control functions, the ARM 32-bit RISC core processor dissipates very low power and fits into an extremely compact die size, providing an optimized hardware solution. The ARM architecture contains the TDMI feature, which compresses 32-bit instructions down to 16 bits, significantly increasing code density and reducing the program memory space required. Further, the C-Language compiler generates very efficient code compared to that generated by assembly language, thereby reducing the time required to write and debug programs.

Product Highlights:

- Integrates five key functions on a single chip:

  - ARM® 32-bit RISC processor with

    ~ System control

    ~ Servo control

- Program memory
- PRML read channel

  - Ultra DMA33 disk controller

- ARM processor core

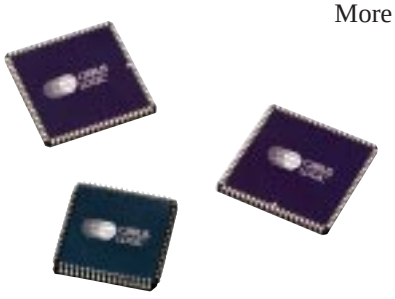
  - Open processor architecture protects firmware investment, allows choice of silicon suppliers

  - Very small size and low power dissipation, ideal for mobile and consumer appliances

  - TDMI feature compresses 32-bit instructions, minimizes software size and cost

  - Wide selection of development tools from ARM and third-party vendors

More . . .



Systems In Silicon!

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Product Highlights Continued:

- ATA-4 host interface with Ultra DMA33 mode

  - Speeds host data retrieval, lightens CPU workload

  - Eliminates performance bottleneck

- PRML read-channel core

  - Supports data transfer rates of 300 Mbits/sec.

  - Proprietary technology allows for increased per-platter storage

Read-Channel Architecture with PRML Technology

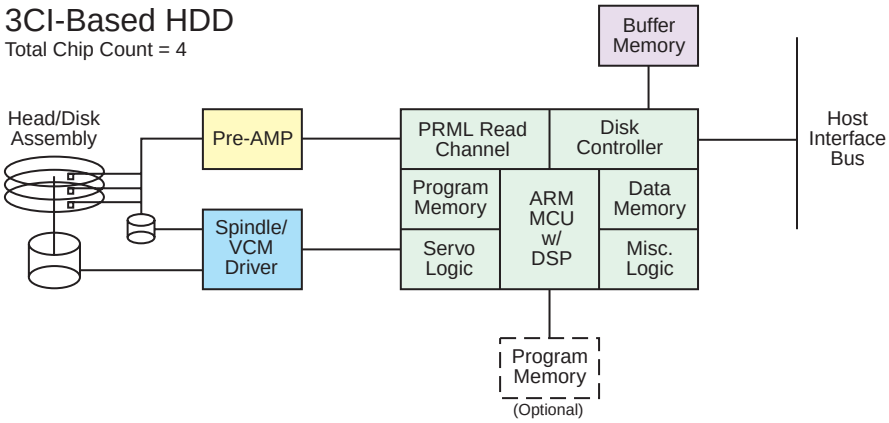
The 3CI platform integrates Cirrus Logic's industry-leading PRML read-channel core. Manufactured in 0.35-micron, state-of-the-art CMOS process, the current read-channel core is capable of data transfer rates of 300 megabits per second, which will extend to 500 megabits per second with 0.25-micron solutions. In addition, because the core is manufactured using CMOS process technology, it is considerably cheaper and easier to integrate than its BiCMOS competitors.

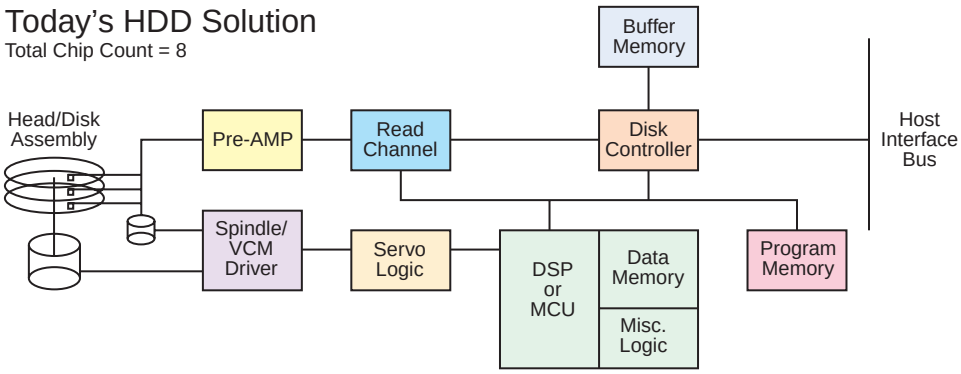
To facilitate the creation of higher-capacity drives with reduced cost per Mbyte, Cirrus' proprietary PRML technology increases the hard disk drive's per-platter storage capacity by as much as 20-percent over standard PRML technology.

Integrated HDD Controller

The 3CI platform integrates a Cirrus Logic hard disk controller, featuring an ATA-4 host interface with Ultra DMA33 mode, which sustains host data rates of 33.3 megabytes per second. This high-speed interface allows for faster data retrieval, freeing up the CPU for additional tasks and eliminating the performance bottleneck associated with sequential streaming applications, such as video playback.

Another key feature of the hard disk controller is Cirrus Logic's ECC (error correction code) technology, which improves system performance with its ability to correct multiple errors on-the-fly with no firmware intervention.





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