

# AIC™ -33C94

## Enhanced SCSI Bus Controller



### Product Highlights

- Synchronous SCSI data transfer rate up to 10 MBps
- Programmable 128-word Writable Control Store for handling SCSI protocol and data transfer
- Support for SCSI Configured automatically (SCAM) protocol with low-level SCSI bus control
- Split-bus architecture with dedicated 8-bit microprocessor interface and integrated DMA controller, programmable to be bus master or slave
- 32-word by 9-bit dual port registers to store commands, messages, and status

### Overview

The Adaptec® AIC-33C94 Enhanced SCSI Bus Controller (ESBC) is ideal for the needs of today's peripheral systems. SCSI command automation coupled with custom programmability provides a flexible solution for OEM designers. These features, integrated into a system with Adaptec host systems, deliver end-to-end compatibility and leading-edge performance.

### Key Benefits

#### Fast, efficient data transfer

The AIC-33C94 ESBC controls data transfers between the 8-bit SCSI bus and the local data buffer. A split-bus architecture provides separate CPU and DMA buses that enable concurrent operations for optimum performance. The CPU bus is a dedicated 8-bit microprocessor interface. The 16-bit DMA bus is programmable to handle either 8-bit or 16-bit transfers, delivering a maximum data transfer rate of 10 MBps in 8-bit mode or 20 MBps in 16-bit mode. The total time required to perform arbitration, selection, command transfer, and message transfer is less than 20 microseconds.

A 32-byte on-chip RAM buffer enables the storage of command, message, and status bytes, reducing code development and ensuring more efficient operation by reducing the burden on the CPU. A pipelined 24-bit transfer counter, specifiable

in bytes or blocks, enables larger data transfers to be performed with a single command.

#### Programming flexibility

The AIC-33C94 controllers can handle SCSI protocol and data transfer through a 128-word Writable Control Store (WCS), which allows developers to program any sequence of SCSI bus phases. The AIC-33C94 controller can act as a target as well as an initiator.

#### Simplified development

An advantage of the AIC-33C94 controller is ease of development. An evaluation kit is available that helps speed time to market. It includes an evaluation board with sample WCS, SCSI, and SCAM Level 1 and Level 2 codes that can be quickly customized. Easy-to-follow flow charts and application notes provide step-by-step programming guidance. Either target or initiator mode can be emulated for evaluation and debugging.

#### Power management

For implementations where power consumption is an issue, the AIC-33C94 controller features an automatic sleep mode. If the controller is idle for a specified period of time, it powers down. It goes back into operation within 200 nanoseconds. This feature is beneficial for portable-based applications.

# AIC-33C94 FEATURES SUMMARY

Adaptec, Inc.  
 691 South Milpitas Boulevard  
 Milpitas, California 95035  
 Tel: (408) 945-8600  
 Fax: (408) 262-2533

Adaptec Europe - Belgium  
 Tel: (32) 2-352-34-11  
 Fax: (32) 2-352-34-00

Adaptec Japan - Tokyo  
 Tel: (81) 3-5365-6700  
 Fax: (81) 3-5365-6950

Adaptec Singapore  
 Tel: (65) 278-7300  
 Fax: (65) 273-0163

Literature:  
 1-800-934-2766 (USA and Canada)  
 or (510) 732-3829

Pre-Sales Support:  
 1-800-442-7274 (USA and Canada)  
 or (408) 957-7274

World Wide Web:  
<http://www.adaptec.com>

Internet ftp server: <ftp.adaptec.com>

Adaptec USA Bulletin Board  
 Service (BBS): (408) 945-7727  
 (up to 28,800 baud, using 8 bits,  
 1 stop bit, no parity)

Interactive Fax: (303) 684-3400



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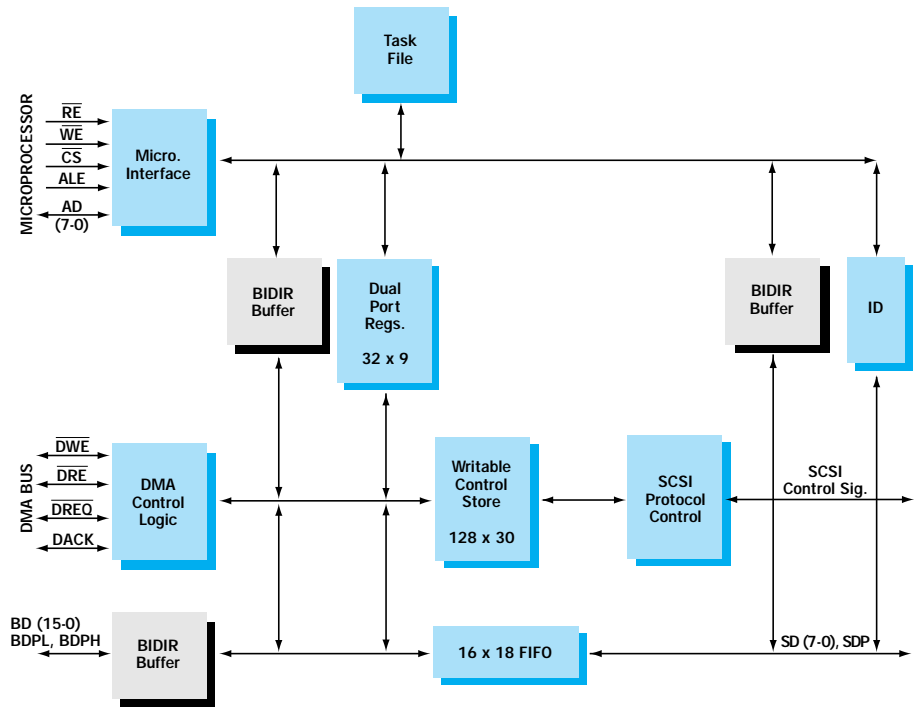
## AIC-33C94 ESBC Technical Information

- Features:**
- Automatic response to a bus-initiated selection/reselection
  - 16-word FIFO to support synchronous offset up to 32 bytes
  - Programmable synchronous transfer period
  - Pipelined 24-bit transfer counter
  - Transfers that can be specified in bytes or logical blocks
  - Microprocessor that also accesses the internal registers through the DMA bus
  - All the signals needed for users to interface 8-bit differential bus
  - Power-down mode if not active

- Applications:**
- Tape drives
  - CD-ROMs
  - Printers
  - Scanners
  - Copiers
  - DVDs
  - Analyzers
  - Voice mail
  - Instrumentation

**Packaging:** 100-pin MQFP

- Design Support Tools:**
- Demo94 Board
  - WCS assembler and sample codes
  - SCAM sample codes
  - Sample schematics
  - Application Notes



AIC-33C94 Enhanced SCSI Bus Controller Architecture