

Adaptec® AIC-7901



Single-Channel PCI-X-to-Ultra320 SCSI Single-Chip Host Adapter

Providing outstanding performance and flexibility for servers and high-end workstations, the single-channel AIC-7901 delivers Ultra320 SCSI data rates up to 320 MBytes/sec to address emerging band-width-hungry applications, such as real-time video, data mining, Internet/Intranet, and scientific modeling and simulation. The chip features a 66 MHz, 64-bit PCI interface and a 133 MHz, 64-bit PCI-X interface.

Migration to new Ultra320 SCSI technology is easy with the AIC-7901. It is backward compatible with Ultra320, Ultra160, Ultra2, and earlier SCSI generations. The chip is available in a 356-pin Thermally Enhanced Ball Grid Array (TEBGA) package, which is signal compatible with the Ultra160 SCSI AIC-7892 for a smooth upgrade to Ultra320 SCSI.

Now offered with the AIC-7901 is HostRAID™, an advanced RAID solution that includes hardware mirroring on the AIC-7901. HostRAID offers bootable RAID levels 0 and 1 with other advanced RAID features such as dedicated hot spares with automatic recovery, on-line capacity expansion, event scheduling, SAF-TE support, SNMP, DMI, and on-line RAID level migration.

Increased SCSI and System Performance

The AIC-7901 uses Ultra320 technology to double Ultra160 data transfer rates – up to 320 MBytes/sec. In addition, Adaptec Seamless Streaming™ technology allows the AIC-7901 to take full advantage of the SCSI packet protocol enhancements (transfers multiple commands, data contexts and statuses in single connection) that replaces the legacy SCSI protocol (transfers single commands, data contexts or statuses per connection).

The AIC-7901 also supports Quick Arbitration and Selection (QAS) and SCSI arbitration fairness. QAS reduces the overhead of control release on the SCSI bus from one device to another. This improvement reduces command overhead and maximizes bus utilization. SCSI arbitration fairness prevents a device from dominating the bus by guaranteeing that all devices have an opportunity to arbitrate.

Improved Data Integrity

The AIC-7901 fully supports Cyclic Redundancy Check (CRC) for 16-bit SCSI synchronous data transfers. CRC detects data integrity errors that would not be detected by simple parity checking used by previous SCSI generations. The higher data rates achieved on existing Low Voltage Differential (LVD) cable configurations mandated this improved data integrity feature.

SCSI Bus Configuration Testing

The AIC-7901 fully supports Domain Validation, which provides two levels (Basic and Enhanced) of SCSI bus configuration testing to help ensure Ultra320 and Ultra160 SCSI topologies operate at optimum speed.

Extended Cable Lengths

Using Low Voltage Differential (LVD), each AIC-7901 channel supports a maximum of 15 devices on a 12-meter cable. In a point-to-point arrangement, cabling can extend to 25 meters.

Backward Compatibility

The AIC-7901 incorporates an advanced multi-mode SCSI I/O cell that supports Ultra2, Ultra160, and Ultra320 SCSI LVD devices, as well as single-ended devices. With only Ultra2, Ultra160, and Ultra320 devices attached, the SCSI bus performs at full speed and full LVD cable lengths. When SE devices are attached, the bus defaults to SE speed and cable length.

Product Benefits

- 320 MByte/sec SCSI data transfer rates
- 133 MHz, 64 bit, PCI-X interface that provides 1066 MByte/sec bandwidth
- Signal compatible with AIC-7892x Ultra160 SCSI ASIC
- Supports HostRAID™ hardware mirroring
- PCI 2.3 and PCI-X 1.0A compliant
- Supports up to 15 Ultra320 devices on a standard cable configuration up to 12 meters

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Performance	<ul style="list-style-type: none"> • Up to 320 MBytes/sec on the Ultra320 SCSI bus • 133 MHz, 64-bit PCI-X interface • PCI-X transfer rates up to 1066 MBytes/sec, PCI-X interface zero wait-state data transfer rates • Operates on PCI buses down to 33 MHz, 32-bit • Two 40-MIPS PhaseEngine RISC processors with Context and Exception interrupts and dynamic data width transfers for fast SCSI command processing • Commands remain resident in AIC-7901 until completed (always available at reselection; no latency) • Number of command completion statuses reported per interrupt increases as SCSI workload increases • Endian support in hardware for command and Scatter-Gather data transfer to reduce driver translation overhead
Additional Features	<ul style="list-style-type: none"> • Seamless Streaming technology – allows full implementation of SCSI packet protocol for sending many commands, receiving many statuses, and transferring data for many commands during one SCSI connection, and with virtually no delay between packets for different commands • Advanced multimode Ultra320 SCSI I/O cell for supporting Low Voltage Differential (LVD) or single-ended devices • External board, sense and control capability (i.e. terminator enabled, cable present) • PCI/PCI-X Message Signaled Interrupt support (normal and exception messages) • PCI/PCI-X card BIOS is stored in 512 Kbytes external FLASH with selectable access support (70, 90, 120, 150 ns) • Full Ultra320 and Ultra160 SCSI Domain Validation and CRC support • JTAG boundary scan to support system-level interconnect testing • 3.3V/5V PCI and 3.3V PCI-X interfaces, providing flexibility for designing high-performance, low-power systems • Enhanced Logical Unit Number (LUN) support up to a maximum of 512 LUNs
Software Support	<ul style="list-style-type: none"> • Microsoft® Windows NT®, Windows®2000, Windows 95 and 98, Windows XP, Windows. NET, Linux, Novell NetWare, and SCO UnixWare
SCSI Device Support	<ul style="list-style-type: none"> • Connection for up to 15 SCSI devices • Support for a combination of 16-bit Ultra320, Ultra160, Ultra2, Ultra, and standard SCSI devices including disk drives, disk arrays, tape drives, CD-ROM and CD-R drives, jukeboxes, removable drives, scanners, and printers • Slower Ultra SCSI legacy devices can be connected to Adaptec's AIC-3860 LVD-to-single-ended SCSI transceivers for optimal SCSI bus performance on the LVD side




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