

Application: SCSI RAID Controller Pericom Device: PI7C21P100 – 64-bit/133MHz PCI-X Bridge

Overview

Small Computer System Interface (SCSI) is a protocol originally developed for attaching peripheral devices to computers. Over the course of some two decades, the standard has evolved over 9 types of SCSI. With each new generation, backward compatibility and legacy support were always kept in place. The fastest type available in the mainstream today is the Ultra320 SCSI, with data transfers reaching 320 MB/sec.

Some other key features of Ultra320 SCSI are:

- **Double Transfer Speed:** This doubles the transfer rate across the SCSI, allowing for higher transfer rates and increase in performance.
- **Packetized SCSI:** Packetized devices decrease command overhead and improves performance through better bus utilization.
- **Quick Arbitration and Selection (QAS):** This reduces the command overhead and maximizes bus utilization.
- **Read and Write Data Streaming:** Increases performance by reducing overhead.
- **Flow Control:** Increases performance by optimizing pre-fetching of data during writes and flushing of data during reads.

To keep up with today's processors generating multiple data streams, RAID (Redundant Array of Inexpensive Drives) arrays may be used. RAID provides a convenient, low-cost, and highly reliable storage by saving data on more than one disk simultaneously. The basic idea of RAID is to combine multiple inexpensive disk drives into an array of disk drives to obtain performance, capacity and reliability that exceeds that of a single large drive. The array of drives appears to the host computer as a single logical drive.

SCSI, along with RAID, is utilized on controller cards that interface large disk farms with mid-range servers as well as performance workstations.

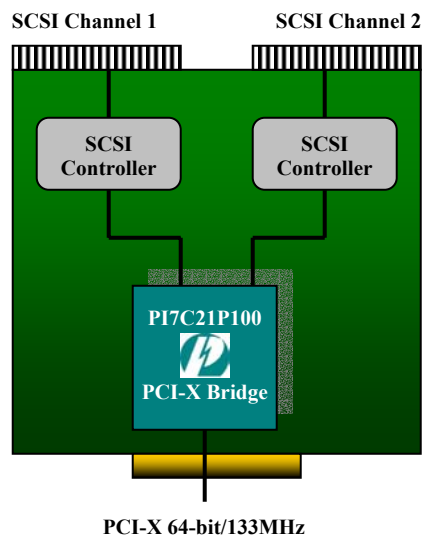


Pericom Solution

The PI7C21P100 may be used mainly for two reasons on these SCSI RAID controller cards. First, the average number of drives in a server usually is equal to at least four. With the drives expected to support data rates exceeding 40 MB/sec per drive, one Ultra320 SCSI channels (320 MB/sec) can support up to 7 drives. Two Ultra320 channels (640 MB/sec), which would require two Ultra320 devices or controllers, would be required to support systems with more than 7 drives. Because PCI/PCI-X standards require that only one device reside in each PCI/PCI-X slot, the PI7C21P100 is used on the controller card. The PI7C21P100 provides the connectivity on the secondary side for the Ultra320 devices.

Since conventional PCI at 64-bit / 66MHz can only support a theoretical maximum of 528 MB/sec, the PCI bus will saturate before the two Ultra320 devices supporting up to 640 MB/sec can achieve maximum throughput. Therefore, a 64-bit/66MHz bridge will not be able to support this configuration. This configuration will need to move from a conventional PCI bus to a PCI-X bus. The PI7C21P100 provides the necessary bandwidth by supporting 64-bit / 133MHz operation, or 1066 MB/sec performance.

Dual-Channel SCSI RAID Controller Card



Key Features & Specifications

- ❑ PI7C21P100
 - 64-bit/133MHz Primary and Secondary Ports
 - Asynchronous mode support
 - Compliant with the following specifications:
 - *PCI Local Bus Specification*, Revision 2.2
 - *PCI-to-PCI Bridge Architecture Specification*, Revision 1.1
 - *PCI-X Addendum to the PCI Local Bus Specification*, Revision 1.0a
 - Concurrent Primary and Secondary port operation
 - Primary and Secondary buses may run in either conventional PCI mode or PCI-X mode in any combination
 - Configurable free space in memory data FIFO
 - *Dynamic Prefetching Control*
 - Unique algorithm to handle memory reads more efficiently
 - Packages:
 - 304-pin BGA package
 - Extended commercial temperature support
 - 0°C to 85°C
 - Replaces Tundra TSI310 (formerly IBM 21P100)

Key Benefits

- ❑ Enables add-in cards to have multiple ports or multiple devices
- ❑ Asynchronous mode support
- ❑ Extended Commercial Temperature range
- ❑ Enhanced Performance

Additional Information

- ❑ Public Website
 - Datasheets, Product Line Presentation, IBIS models, Application Notes, Quality, & Package Data
<http://www.pericom.com/products/pci/psempart.php?productID=PI7C21P100>
- ❑ Order Literature Online
 - Product Selection Guide and Cross Reference
 - Databook CD

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