Tsi308™ HyperTransport-to-PCI/X Product Brief

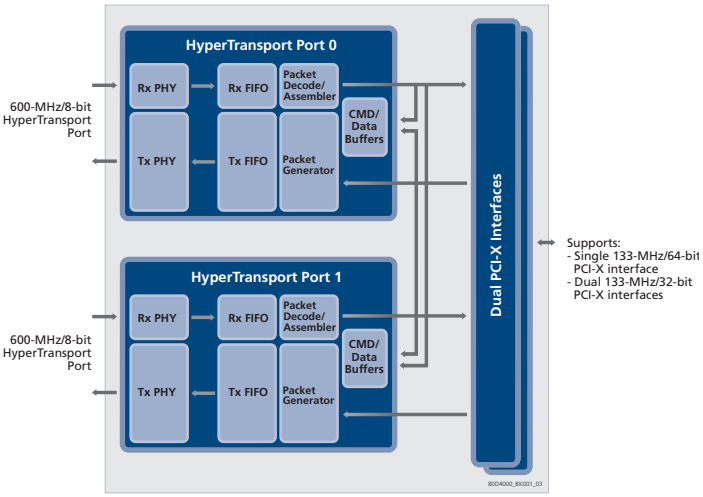
Device Overview

The IDT Tsi308 is a high performance third generation HyperTransport™-to-PCI/X bridge capable of transferring data between the HyperTransport (HT) host port and the other HT port or the PCI/PCI-X port. It is designed for bandwidth-hungry and performance-intensive applications in communications, networking, servers, and storage systems.

The next generation Tsi308 HT-to-PCI/X bridge expands the possibilities of today's systems architects by providing HT-based design options never possible before. Each HT port operates at a frequency of up to 600 MHz DDR for both transmit and receive directions and sustains a total aggregate bandwidth up to 19.2 Gbps per 8-bit bidirectional HT port. Each Tsi308 HT port can be 2, 4, or 8 bits wide in both transmit and receive directions.

Tsi308 supports one 64-bit, PCI/X (1.0b) configurable port. A fairness algorithm allocates bandwidth among devices, thereby eliminating starvation of bridges at the end of the chain. Up to 31 devices can be daisy-chained to build higher capacity systems with multiple PCI/X buses and HT-based peripherals.

Block Diagram



Features

HyperTransport Interfaces

- Two bidirectional 8-bit HyperTransport interfaces:
  - Supports 200, 300, 400, 500, and 600 MHz DDR (double data rate) for peak bandwidth of 2.4 GBps per 8-bit bidirectional HT port
  - Supports dynamic frequency reprogramming
- Complies with *HyperTransport 1.05 Interface Specification*.
- Tunnels between the two HyperTransport interfaces.
- No protocol-induced maximum HyperTransport link length, which allows system designers to optimize speed vs. distance.
- Supports dual-hosted chain

PCI/X Interface

- One 64-bit configurable PCI/X port:
  - 1 x 64 bit, up to 66 MHz PCI 2.2 or up to 133 MHz PCI-X (1.0b)
  - 2 x 32 bit, up to 66 MHz PCI 2.2 or up to 133 MHz PCI-X (1.0b)
- Complies with *PCI Local Bus Specifications, Rev. 2.2*
- Supports with parity and error checking features
- Transaction forwarding for the following commands:
  - All I/O and memory commands
  - Type 1 to Type 1 configuration commands (downstream only)
  - Type 1 to Type 0 configuration commands (downstream only)
- Built-in two-level PCI arbiter with support for up to six devices
  - Can also be configured to support an external arbiter.
- 3.3 V PCI I/O with 5 V tolerant I/Os

Other

- Supports daisy-chaining up to 31 devices. The bandwidth is shared among the devices using a fairness algorithm.
- Superset register compatible with the Tsi301 to leverage the same software driver
- Can be configured to emulate a single or a dual Tsi301 devices
- Evaluation board available with firmware and software drivers.
- JTAG port

Physical

- Power: 1.8 V core, 1.2 V HT I/O, 3.3 V PCI/X I/O
- Package: 388-pin HSBGA

Benefits

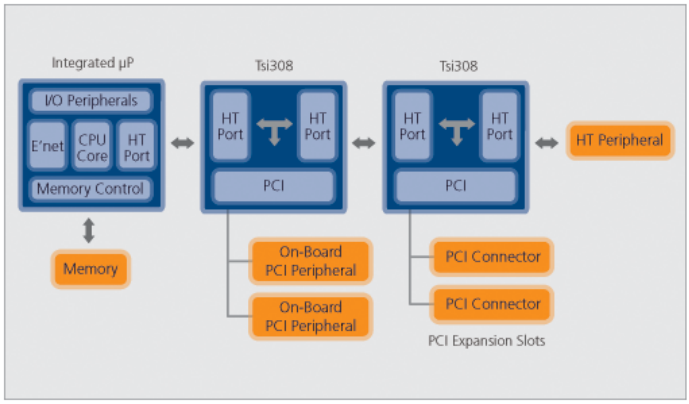
- Bridges between HyperTransport and legacy PCI bus breathing new life into legacy systems, which are encumbered by the limits of traditional PCI fabrics
- 2.4 GB/s bandwidth supports the needs of data transfer applications
- Host CPUs can be connected to both HT interfaces for greater system flexibility and sharing PCI-based resources
- Supports PCI Plug and Play, reduces system design complexity, and time to market
- Low power consumption increases system reliability
- Built-in PCI/X arbiter reduces system cost
- Uses existing PCI drivers and firmware to reduce system development and debug time
- 31 devices can be daisy-chained to enable a flexible and modular system implementation
- Deterministic low latency per tunnel meets the requirements of real-time applications

Typical Applications

The feature set of the Tsi308 makes it ideal for a variety of computing and embedded systems including:

- Enterprise LAN switches
- Storage systems and switches (SAN, NAS, RAID, FC)
- Firewalls and security gateways
- High-end computing systems
- Servers and server clusters
- Printers, graphics and imaging systems
- VPN switches / routers
- Edge and access routers
- MAN switches
- Wireless gateways
- Voice and multimedia access gateways
- Multiservice access concentrators
- IP service switches and core routers
- Test equipment and network probes

Typical Application Diagram



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