Tsi382A™

PCI Express to PCI Bridge

Features

General

- PCI Express 1.1 to PCI bridge
- Transparent and Non-transparent addressing modes
- Efficient queuing and buffering for low latency and high throughput
- Legacy mode support for subtractive decode
- Compliant with the following specifications:
  - *PCI Express Base 1.1*
  - *PCI Express PCI/PCI-X Bridge 1.0*
  - *PCI-to-PCI Bridge Architecture 1.2*
  - *PCI Local Bus 3.0*
  - *PCI Bus Power Mgt. Interface 1.2*

The Tsi382A supports Legacy mode operation, which configures the device as a subtractive decode PCIe-to-PCI bridge.

PCI Express

- x1 lane PCIe Interface
- Advanced error reporting capability
- End-to-end CRC check and generation
- Up to four outstanding memory reads
- ASPM L0 link state power management
- Legacy interrupt signaling and MSI interrupts
- Native Hot Plug support

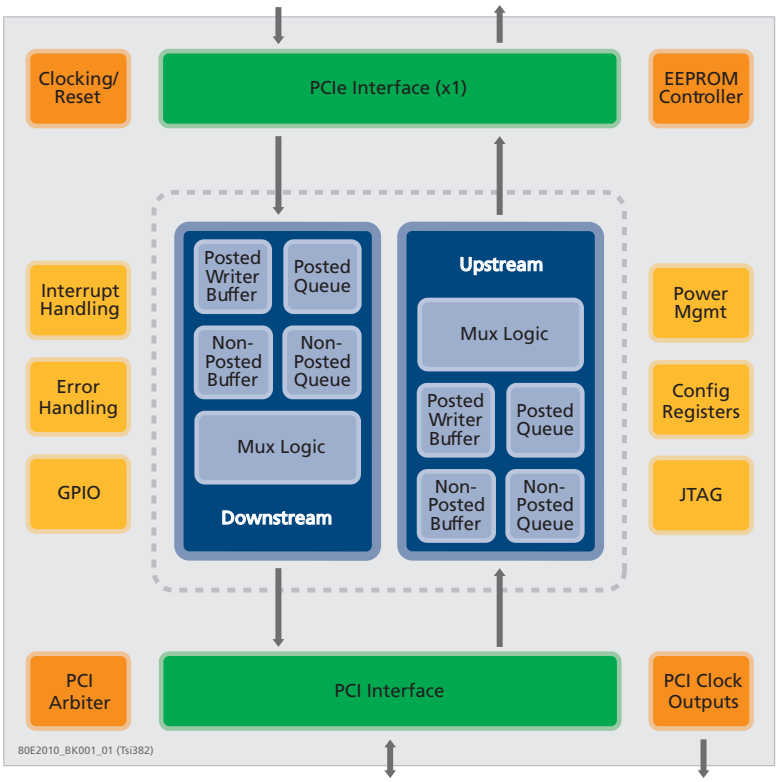
PCI

- 32/64-bit addressing and 32-bit data
- Operates up to 66 MHz
- Up to eight outstanding memory reads
- PCI clock outputs for up to four devices
- Four external PCI masters supported through internal arbiter
- 3.3V PCI I/Os, 5V tolerant
- MSI generation and handling using interrupt and GPIO signals

The Tundra Semiconductor Tsi382A is a high-performance bus bridge that connects PCI Express based devices to legacy PCI devices. The Tsi382A's PCIe Interface supports a x1 lane configuration, which enables the bridge to offer throughput performance of up to 2.5 Gbps per transmit and receive direction.

The device's PCI Interface operates up to 66 MHz, and supports transparent and non-transparent addressing. The Tsi382A supports Legacy mode operation, which configures the device as a subtractive decode PCIe-to-PCI bridge.

Block Diagram



Smallest Footprint

The Tsi382A BGA package has the smallest footprint of any PCIe-to-PCI device on the market. The device is offered in a 10 x 10 mm package with a standard 0.8-mm ball pitch, making it ideal for PCI ExpressCard applications or similar designs that have limited component space. For cost-sensitive applications, the Tsi382A is also available in an LQFP package.

In addition, by providing sufficient clock outputs for up to four PCI devices, board space is further reduced by eliminating the need for an external clock buffer.

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Other Features

- Masquerade mode
- JTAG IEEE 1149.1, 1149.6
- Four GPIO pins and four interrupt pins that can generate MSIs
- D0, D3 hot, D3 cold power management state support
- 1.2V core power supply, 3.3V I/O
- No power sequencing constraints
- Packaging:
  - BGA: 144-pin, 10 x 10 mm, 0.8 mm ball pitch, Industrial operating temperature, RoHS/Green compliant
  - LQFP: 176-pin, 20 x 20 mm, Commercial operating temperature, RoHS compliant

Benefits

- Enhances system performance by delivering high throughput and low latency across the bridge
- Simplifies system design by offering numerous programmable features
- Minimizes board space due to small footprint of BGA package

Design Support Tools

Tundra is committed to helping customers minimize their time to market. That's why we provide one of the highest levels of design support in the industry, including:

- Application notes
- Evaluation boards
- IC models
- Hardware and software development tools

Low Power Consumption

The Tsi382A has typical power consumption of less than 0.7W, and it incorporates advanced power management modes to minimize consumption during operation.

High Performance

In addition to low-latency operation, the Tsi382A's superior queueing architecture and rich feature set allow designers to optimize their overall system performance. Features such as short-term caching also enable designers to tune the device's performance for different applications.

Transparent and Non-transparent Bridging

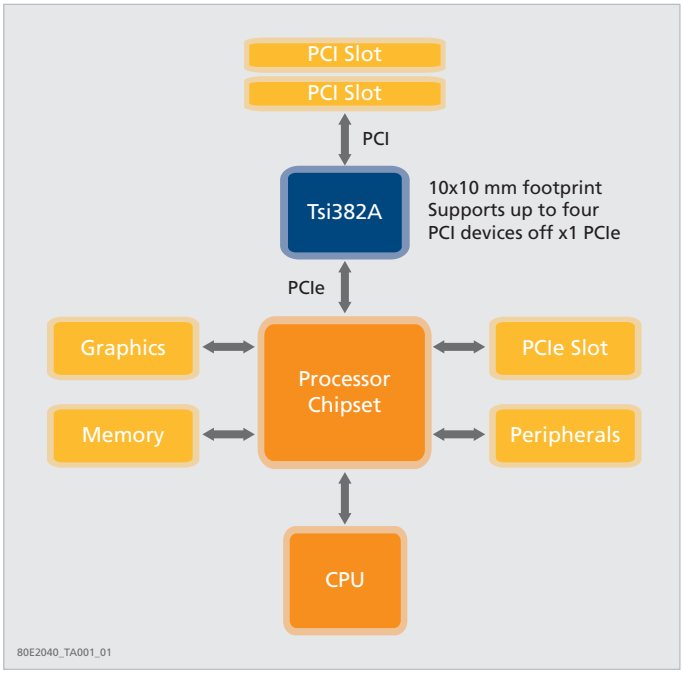
Transparent mode operation is available for efficient, flow-through configurations, while non-transparent bridging enables multi-host systems and is used in applications such as intelligent adapter cards.

Typical Applications

The Tsi382A is suited to applications that need to bridge PCIe to downstream PCI devices. Its flexibility, high performance, small footprint, and low power consumption, make it ideal for a range of applications, including:

- Motherboards
- PC adapter cards (communications, graphics, imaging, and multimedia)
- Digital video recorders
- ExpressCards for laptop computers
- Multifunction printers
- Line cards and NICs

Motherboard Application



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Tundra Semiconductor Corporation
603 March Road, Ottawa,
Ontario, Canada, K2K 2M5
Phone: +1 613-592-0714 Toll-free: 800-267-7231
Fax: +1 613-592-1320 info@tundra.com

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