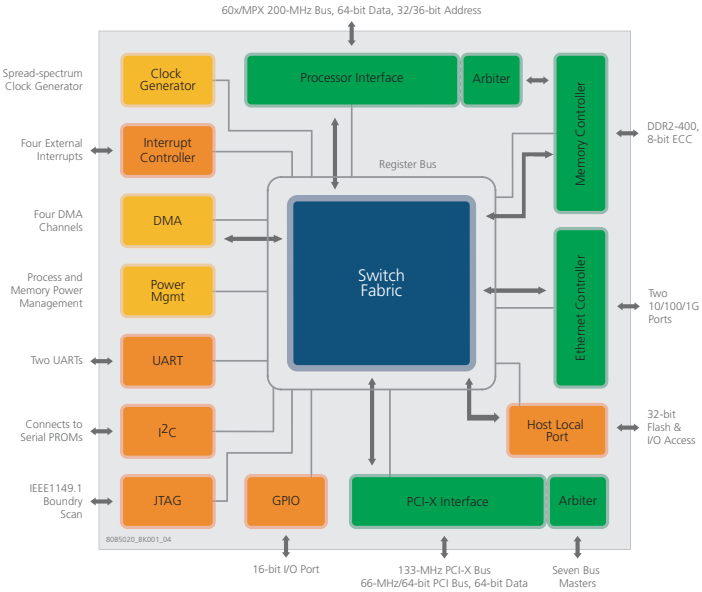
Tsi109 Host Bridge for PowerPC™ Product Brief

Device Overview

The IDT Tsi109 is an advanced host bridge for PowerPC processors that supports PCI-X, DDR2-400 SDRAM, Gigabit Ethernet, and Flash. The device contains numerous integrated features that enable customers to reduce system design complexity and system costs. As a result, the Tsi109 has the best price/benefits ratio on the market.

The Tsi109 builds on a decade of IDT design experience in PowerPC host bridging. It delivers industry-leading performance for customers in the wireless infrastructure, storage networking, network access, printer, military, and industrial automation markets.

Block Diagram



Enhancing System Performance

The advanced Switch Fabric architecture of the Tsi109 allows designers to significantly enhance system performance. The Ethernet Controller and PCI-X Interface offer superior data transfer rates. In addition, CPU to memory performance is exceptional due to features like configurable port arbitration priority and queuing reads ahead of writes.

Minimizing System Cost

The Tsi109 feature set provides system designers with an array of integrated functionality to assist in lowering overall system cost, such as an integrated Clock Generator with spread-spectrum capabilities, a DDR2-400 Memory Controller, and internal processor and PCI/X bus arbiters.

Simplifying Design

Tsi109's flexible configuration options empower designers to develop their systems quickly and efficiently. Selection of PCI/PCI-X modes, an integrated Clock Generator, DDR2 support, and the ability to configure it as a PCI Host/Agent, all enable the Tsi109 to be used in a range of applications. The JTAG Interface also simplifies the debug process by allowing access to Tsi109's registers without impacting active transactions.

Effective Power Management

The Tsi109 is the lowest, power-consuming host bridge on the market. It minimizes active power by disabling unused ports and clocks, while its integrated Clock Generator saves power over discrete devices. Its support for DDR2 provides memory power savings of up to 50 percent when compared with DDR. It also supports precharge power-down and quiet stand-by power reduction modes on memory. In addition, the Tsi109 conforms to the PCI Bus Power Management Interface Specification.

Features

Processor Interface

- Supports PowerPC processors:
  - Freescale MPC74xx
  - IBM PPC 750xx
- Operates up to 200 MHz in single processor mode
- Operates up to 167 MHz in dual processor mode

PCI/X Interface

- Supports PCI 2.3 and PCI-X 1.0 modes
- Operates up to 133 MHz
- Supports PCI/X Host or Agent operation
- Supports CompactPCI Hot Swap

Memory Controller

- Supports DDR2-400 devices
- Operates up to 200 MHz
- Enhanced memory pipeline

Other Features

- Integrated bus arbiters for processors and PCI/X devices
- Integrated power management of processors and memory devices
- Four independent DMA/XOR channels
- Clock generator with spread-spectrum capability
- Two independent Gigabit Ethernet ports
- HLP Interface for Flash and other simple I/O devices
- Two UARTs

- 16-bit parallel GPIO port
- I2C/EEPROM Interface
- Programmable Interrupt Controller
- JTAG support (Boundary scan) with register access capability
- Packaging: 1023-pin, 33x33 mm, fcBGA, RoHS-compliant, pin compatible with Tsi108
- Power consumption: 2.5W typical, 3.8W maximum

Benefits

- Enhances system performance by delivering low latency and high throughput across its Processor, PCI-X, and Ethernet interfaces
- Simplifies system design by offering numerous, highly configurable features
- Reduces system cost by providing a variety of integrated functions80B5020_FB001_06
- Enables designers to use the lowest power consuming interconnect product on the market

Typical Applications

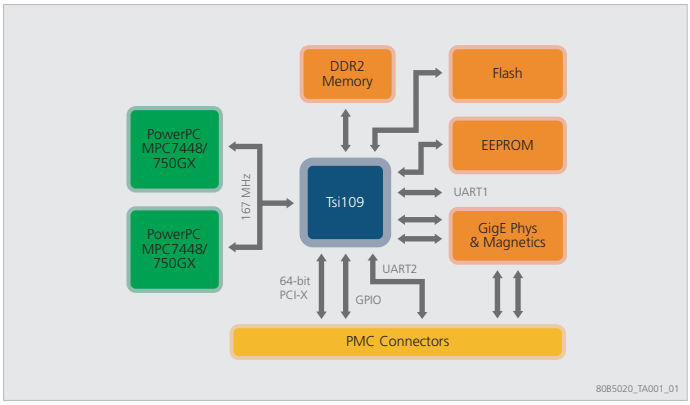
The following examples illustrate the Tsi109 in two typical applications.

Printer Controller Board

The Tsi109 feature set is ideally suited for printer applications. The Clock Generator eliminates the need for external clock circuitry and provides spread-spectrum capability for reducing EMI. The device provides power management for processors, memory, and PCI/X devices, in order to keep idle power at a minimum. In addition, the Tsi109's support for various PowerPC processor lines allows performance scalability with a common design.

Processor PMC

The Tsi109 is well suited for a variety of Processor PMC (PrPMC) embedded applications (see figure). The Clock Generator eliminates the need for external circuitry on the limited real estate of the PrPMC form factor, while the DDR2 Memory Controller provides cost, power, and life expectancy advantages over DDR. Aggressive active power management modes also makes the Tsi109 the lowest power-consuming host bridge product on the market.



CORPORATE HEADQUARTERS
6024 Silver Creek Valley Road
San Jose, CA 95138

for SALES:
800-345-7015 or 408-284-8200
fax: 408-284-2775
www.idt.com

for Tech Support:
email: EHBhelp@idt.com
phone: 408-360-1538
document: 80B5020_FB001_06