



# Tsi110™ Host Bridge for PowerPC® Product Brief

## Device Overview

The IDT Tsi110 is a low-cost PowerPC interconnect device that bridges PCI/X, DDR2 SDRAM, Gigabit Ethernet, and Flash. The integrated features of the Tsi110 serve to reduce the number of components in a system, resulting in significantly lower system cost, power, and design complexity. The Tsi110 is well suited for a variety of applications, including entry-level router and storage, consumer appliance, set-top box, video surveillance, video/IP, and printers.

IDT's experience in building PowerPC host bridges ensures that the Tsi110 delivers the highest standards of quality, reliability, and performance that are required in customer applications.

## Lowering System Cost

The Tsi110 is specifically designed to lower system cost. An integrated Clock Generator, a DDR2 SDRAM interface, internal processor and PCI/X arbiters, and a low-power design, all help to reduce the number of board components and overall system cost.

## Lowering System Power

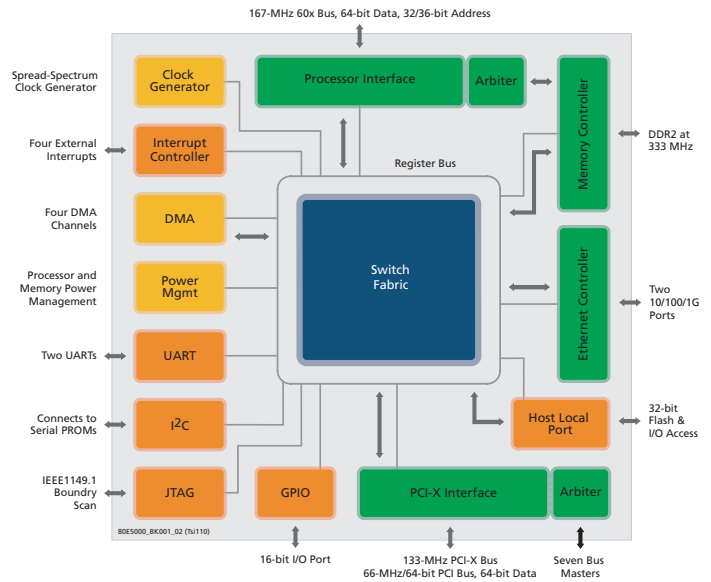
The Tsi110 is optimized for power-sensitive applications. The device's power management features support various power saving modes implemented on PowerPC processors. The Tsi110 also reduces active power by disabling unused ports and clocks, while the integrated Clock Generator saves power over discrete devices.

The Tsi110 supports DDR2 memory which consumes 50 percent less power than DDR (a significant factor for the overall power budget on a board). Precharge power-down and quiet standby power reduction modes on the Memory Controller reduce power consumption even further.

## Reducing Design Effort

The device's superior signal integrity, and thermal and electrical characteristics, ensure that customers can minimize debug time and bring their systems to market faster. DDR2 support offers excellent signal integrity through On-die Termination. Flip-chip packaging offers better electrical and thermal characteristics. The debug process is further reduced by a JTAG Interface that allows register access without interrupting active transactions.

## Block Diagram



## Features

### Processor Interface

- Supports PowerPC processors:
  - IBM PPC 750xx
  - Freescale MPC74xx
- Operates up to 167 MHz

### 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 devices at 333 MHz

### Other Features

- Integrated bus arbiters for processor and PCI/X devices
- Integrated power management for processor 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

## Tsi110 Product Brief

- 16-bit parallel GPIO port
- I2C/EEPROM Interface
- Programmable Interrupt Controller
- JTAG support (Boundary scan) with register access capability
- Packaging: 1023-pin, 33 x 33 mm, fcBGA, RoHS-compliant

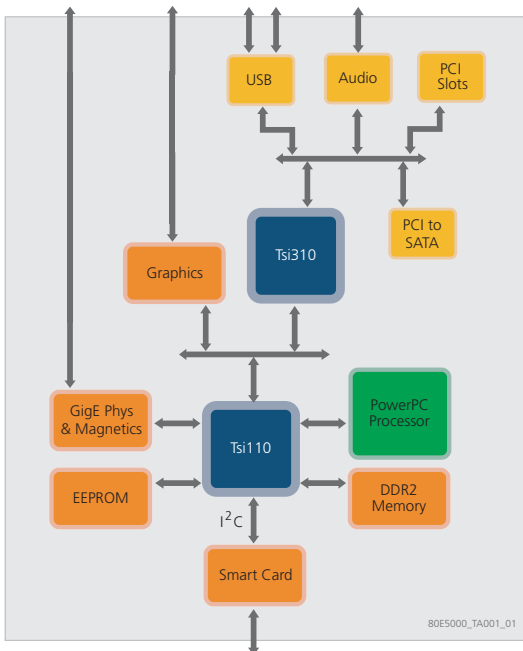
## Benefits

- Lowers system cost by embedding a number of system-level functions
- Reduces device and system power by integrating power minimizing features
- Simplifies design through numerous configurable features

## Typical Applications

### Set-Top Box

The cost-saving features that are integrated into the Tsi110 enable set-top box designers to easily penetrate this growing market. A high-bandwidth PCI-X interface is ideal for allowing multiple I/O connections, such as graphics processing components. In addition, low device and system power features allow for fanless operation, which reduces cost and audible noise.



### Printer Controller Board

The Tsi110 is the right choice for printer applications because of its low cost and power. Idle power is minimized through the power management block. The Clock Generator eliminates the need for external clock circuitry, saving on both power and cost. EMI emissions are also reduced due to the Clock Generator's spread-spectrum capability.

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**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: 80E5000\_FB001\_04



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.