# Tsi148™ PCI/X-to-VMEbus Bridge Product Brief

Device Overview

The IDT Tsi148 device is the next-generation component in our industry leading, high performance VMEbus system interconnect product family. The Tsi148 is fully compliant with the 2eSST and VME64 Extension standards. This enables you to take advantage of the higher performance VME protocols, while preserving your existing investment in VME boards that implement legacy protocols.

The Tsi148 increases a system's usable bus bandwidth because its local bus interface is designed for the next generation PCI/X processors and peripherals that support either a 66 MHz PCI bus or a 133 MHz PCI-X bus interface.

Tsi148 eases design constraints of VME Single Board Computers (SBCs) by requiring less board real estate and power than the previous generation of VME-to-PCI/X bridge components. These capabilities make Tsi148 a key building block of the VME Renaissance and of next generation VME single board computers.

Block Diagram
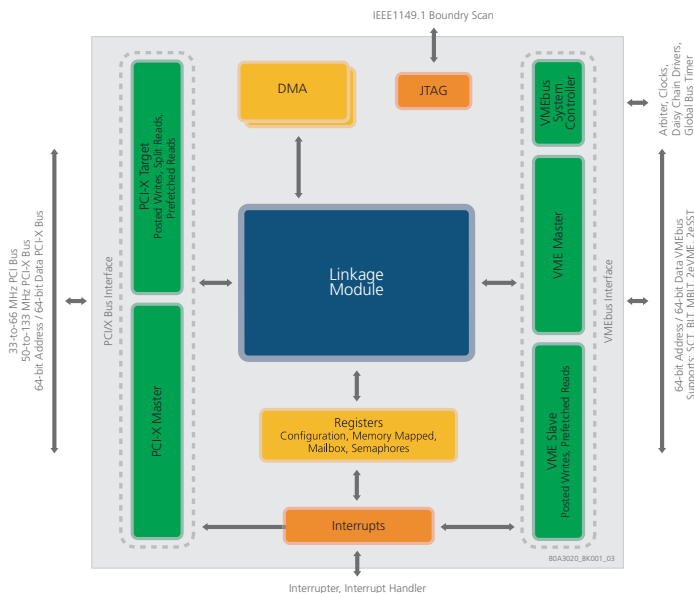
Features

VMEbus Interface
- Standards supported:
  - Legacy protocols to protect existing VME investment
  - VME64 Extensions
  - 2eVME and 2eSST protocols to bring support for higher bandwidth
- Full VMEbus system controller functionality
- Interrupt and interrupt handling capability
- Flexible register set; programmable from both the PCI/X bus and VMEbus

PCI/X Interface
- Fully compliant, programmable PCI or PCI-X bus interface
- 64-bit data path
- Multiple modes of bus operation
  - PCI-X operates from 50 to 133 MHz
  - PCI bus operates from 33 to 66 MHz
- 32-bit or 64-bit addressing and data in PCI and PCI-X modes

Other Features
- Two, programmable DMA controllers with Direct mode and Linked-List mode support
- IEEE 1149.1 Interface
- 456 PBGA package, 1.0 mm ball pitch, 27 mm x 27mm size

Benefits
- Increased bandwidth
  - 4x increase in usable system bus bandwidth over current solutions
- Less power required than existing devices due to reduced voltages
  - 3.3V I/O supply
  - 1.8V Core supply
- Small device footprint
  - 40% less board space required than existing products
- Reliable customer support with experience supporting the VME community for the past decade.

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VME Renaissance

The VME Renaissance is a term defined by MotorolaTM that describes an intense period of intellectual activity and technology infusion focused on the VMEbus. The VME Renaissance is a period of innovation and performance improvement which maintains backwards compatibility to legacy VMEbus standards. This compatibility requirement protects existing customer investments.

The VME Renaissance gives VME a faster parallel backplane interconnect, a switched serial interconnect on the backplane coincident with the traditional parallel interconnect, point-to-point mezzanines on the cards and many other significant innovations.

Typical Applications

Key markets for Tsi148-based VME Single Board Computers:

- Telecommunications
- Industrial automation
- Medical
- Military
- Aerospace

Single Board Computer

The Tsi148 can be used on VME-based Single Board Computers (SBC) that employ PCI/X as their local bus, as shown in the accompanying diagram. These SBC cards support a variety of market segments, including: telecommunications, datacommunications, medical, industrial automation, and military equipment.

The Tsi148 high performance architecture seamlessly bridges the PCI-X and VME busses, supporting the design of the next generation single board computers.

Application Diagram
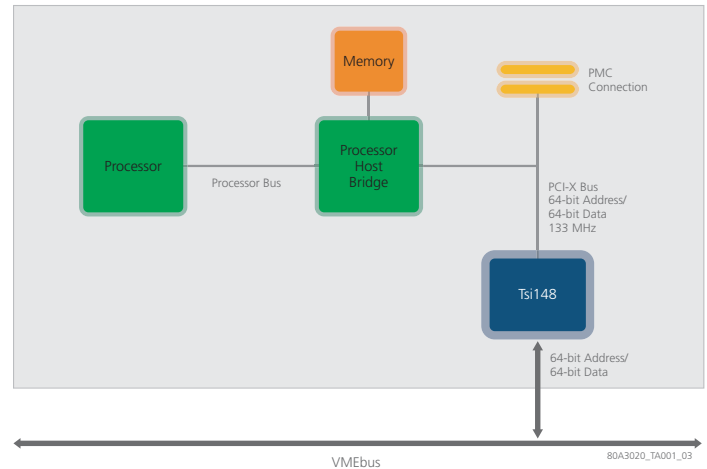
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