



6-Lane 6-Port Gen2 PCI Express® Switch

89HPES6T6G2 Product Brief

Device Overview

The 89HPES6T6G2, a 6-lane 6-port Gen2 PCI Express® switch, is a member of IDT's PRECISE™ family of PCI Express switching solutions. The PES6T6G2 is a peripheral chip that performs PCI Express Base switching with a feature set optimized for servers, storage, communications, and consumer applications. It provides connectivity and switching functions between a PCI Express upstream port and five downstream ports or peer-to-peer switching between downstream ports.

Features

♦ High Performance PCI Express Switch

- Six Gen2 PCI Express lanes supporting 5 Gbps and 2.5 Gbps operation
 - One x1 upstream port
 - Five x1 downstream ports
- Low latency cut-through switch architecture
- Support for Max Payload Size up to 2 Kbytes
- Supports one virtual channel and eight traffic classes
- PCI Express Base Specification Revision 2.0 compliant

♦ Flexible Architecture with Numerous Configuration Options

- Automatic lane reversal on all ports
- Automatic polarity inversion
- Supports in-band hot-plug presence detect capability
- Supports external signal for hot plug event notification allowing SCI/SMI generation for legacy operating systems

- Dynamic link width reconfiguration for power/performance optimization
- Configurable downstream port PCI-to-PCI bridge device numbering
- Crosslink support
- Supports ARI forwarding defined in the Alternative Routing-ID Interpretation (ARI) ECN for virtualized and non-virtualized environments
- Ability to load device configuration from serial EEPROM

♦ Legacy Support

- PCI compatible INTx emulation
- Supports bus locked transactions, allowing use of PCI Express with legacy software

♦ Highly Integrated Solution

- Requires no external components
- Incorporates on-chip internal memory for packet buffering and queueing
- Integrates six 5 Gbps / 2.5 Gbps embedded SerDes, 8B/10B encoder/decoder (no separate transceivers needed)

♦ Reliability, Availability, and Serviceability (RAS) Features

- Ability to disable peer-to-peer communications
- Supports ECRC and Advanced Error Reporting
- All internal data and control RAMs are SECDED ECC protected
- Supports PCI Express hot-plug on all downstream ports
- Supports upstream port hot-plug

Block Diagram

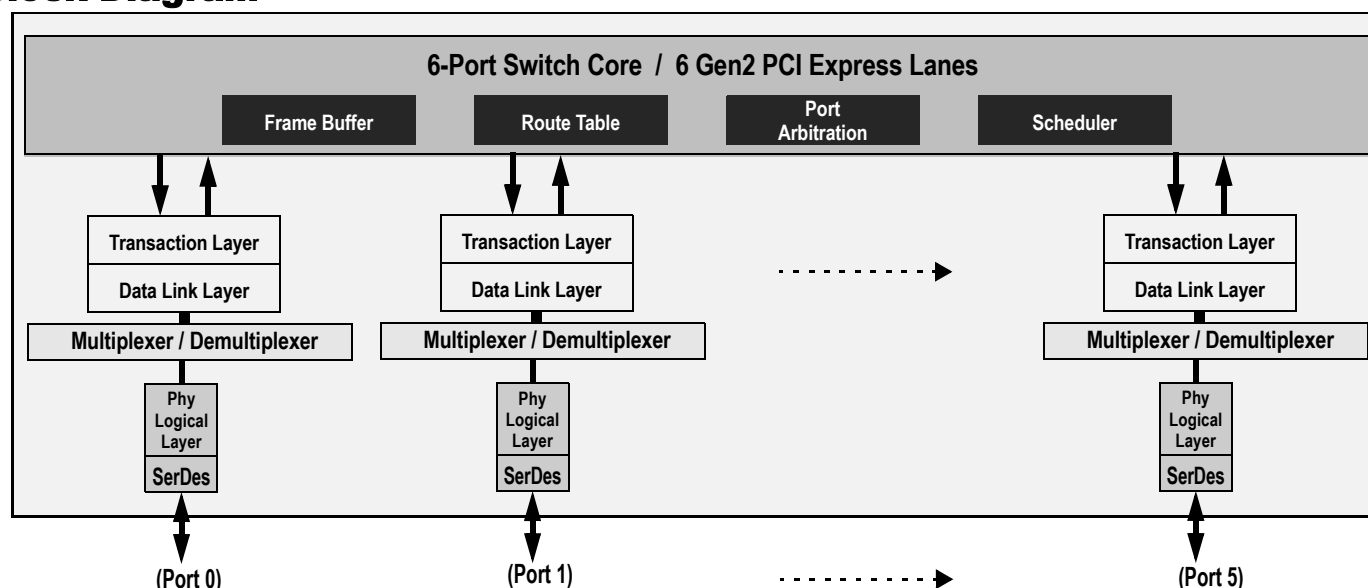


Figure 1 Internal Block Diagram

- ◆ **Power Management**

- ### ◆ Testability and Debug Features

- ◆ **General Purpose Input/Output Pins**

- ◆ Packaged in a 19mm x 19mm 324-ball Flip Chip BGA with 1mm ball spacing

Product Description

Utilizing standard PCI Express interconnect, the PES6T6G2 provides the most efficient I/O connectivity solution for applications requiring high throughput, low latency, and simple board layout with a minimum number of board layers. It provides connectivity for up to 6 ports across 6 integrated serial lanes. Each lane provides 5 Gbps of bandwidth in both directions and is fully compliant with PCI Express Base Specification, Revision 2.0, including operation in 5 Gbps, 2.5 Gbps, and mixed 5 Gbps / 2.5Gbps modes.

The PES6T6G2 is based on a flexible and efficient layered architecture. The PCI Express layer consists of SerDes, Physical, Data Link and Transaction layers in compliance with PCI Express Base specification Revision 2.0. The PES6T6G2 can operate either as a store and forward or cut-through switch and is designed to switch memory and I/O transactions. It supports eight Traffic Classes (TCs) and one Virtual Channel (VC) with sophisticated resource management to enable efficient switching and I/O connectivity for servers, storage, and embedded processors with limited connectivity.

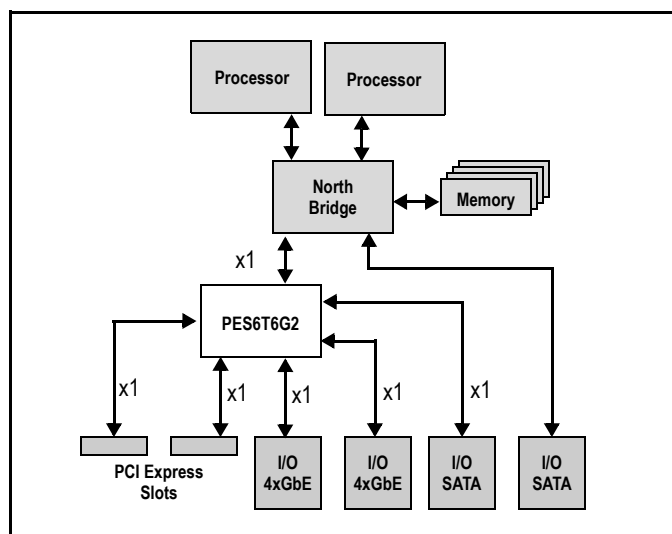


Figure 2 I/O Expansion Application

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