

PEX 8508 Key Features

- ◆ 8-lane PCI Express switch
- ◆ Up to five configurable ports (x1, x2, x4)
- ◆ Integrated SerDes
- ◆ Cut through architecture with under 150 ns latency
- ◆ Quality-of-Service with up to 2 Virtual Channels/port
- ◆ Non-blocking switch fabric with full line rates
- ◆ Peer-to-peer switching and host-centric data transfer
- ◆ SHPC r1.1 compliant hot-plug controller on all ports
- ◆ Dual clock domains w/ SSC & Constant Frequency Clocking
- ◆ I²C interface for configuration
- ◆ 19x19 mm² PBGA package

PEX 8508 Other Features

- ◆ Selectable Non-Transparent bridge port
- ◆ Compliant with PCIe base specification r1.1
- ◆ End-to-end CRC and Poison bit support
- ◆ Basic and Advanced error reporting
- ◆ Hardware fixed and Round Robin packet queue arbitration
- ◆ JTAG boundary scan
- ◆ Link power management states
- ◆ 256 byte payload size
- ◆ Lane and polarity reversal
- ◆ Configuration through host, I²C, or optional EEPROM
- ◆ JTAG Boundary Scan AC/DC
- ◆ System Error (SERR) Signal

Application:

Image Acquisition Systems

PLX Product:

PEX 8508 – 8-Lane PCI Express Switch

Key Benefit:

High Bandwidth, Low Latency Port Fan-Out

Image Acquisition Systems Turning to PCIe

Historically, image acquisition (IMAQ) systems used for test, storage, and analysis in industrial, life science, and biomedical imaging applications have utilized PCI, PCMCIA, USB, and Ethernet interfaces, among others. However, if one is requiring high bandwidth capability, PCI Express (PCIe) is the logical choice. PCIe greatly reduces the possibility of throughput bottlenecks which can easily occur when using legacy bus interfaces.

PCIe's serial, point-to-point architecture is a high performance, dedicated bandwidth solution is ideal for today's high-end IMAQ systems whereas legacy buses such as PCI can get saturated and backed up by the presence of a bandwidth-hungry device such as a Gigabit LAN card. PCIe allows for high-performance image

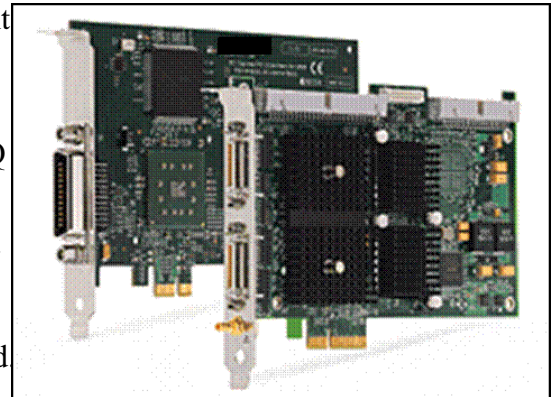


Figure 1. PCIe based Image Acquisition Cards

acquisition without running into throughput bottlenecks. Furthermore, because of its low pin count and highly scalable architecture, PCIe solutions offer a much greater performance per dollar value when compared to other interfaces.

PCIe-based IMAQ systems are used in high resolution applications which require high refresh rates and performance. These systems can be used to monitor movement of an eye cornea during laser eye surgery or clogged arteries during an angioplasty. IMAQ system can also be used for testing and/or failure analysis by viewing material under high pressure environments to identify the precise breaking point. Other uses include microscopy, astronomy, and infra-red (thermal) imaging. These IMAQ systems utilize PCIe Frame Grabbers and the Camera Link cabling interface to connect to the cameras. PCIe-based IMAQ plug-in cards can support both single and dual-channel output (see Figure 1 above).

Flexible & Versatile PCIe Switches

PLX offers a large selection of PCIe switches compliant with the latest PCIe specifications; validated in PLX labs; tested at the PCI-SIG plug-fest and by dozens of customers in their applications. IMAQ system designers can cost-effectively expand the number of PCIe ports to accommodate a larger number of I/Os and maintain a high performance, low latency design using PLX PCIe switches.

The flexibility and versatility of the PLX switches allows designers to build to the needs of the application. The PEX 8508 offers flexible ports that can be configured in any legal width up to x4 while providing high-performance cut-through architecture (150 ns latency); hot-plug capability on every port; and quality of service (QoS) through two Virtual Channels (VCs). Figure 2 shows an example of a PCIe-based IMAQ system.

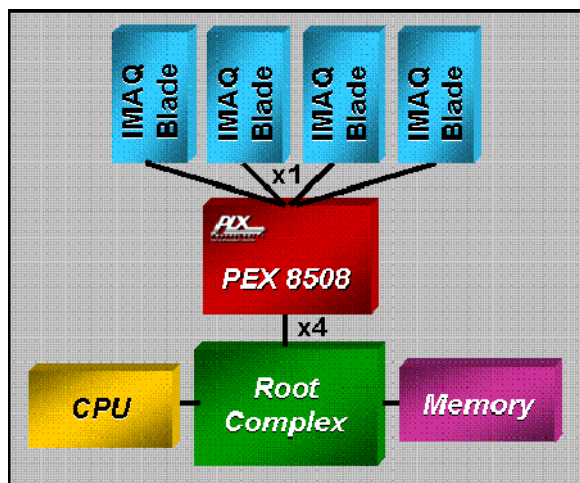


Figure 2. IMAQ Host Chassis

This example shows an IMAQ system host chassis. In this example, the PEX 8508 is used for aggregation. Data coming in from all 4 IMAQ blades is passed through the chip via x1 lanes. The PEX 8508 then pumps the data through to the Root Complex via a x4 lane.

Furthermore, these blades may have PCIe-based IMAQ add-in cards which plug into the blades. This is another possible fit for the PEX 8508. The PEX 8508 can be used to fan-out from the blade to other PCIe components within the IMAQ plug-in card.

Switches & Bridges Available Today!

PLX is shipping three PCIe bridges (PEX 8111, PEX 8114, and PEX 8311) and multiple PCIe switches as shown below.

Device	Lanes	Ports	Availability
PEX 8532	32	8	In Production
PEX 8524	24	6	In Production
PEX 8516	16	4	In Production
PEX 8517	16	5	Sampling Now
PEX 8518	16	5	Sampling Now
PEX 8508	8	5	Sampling Now

More than just Fan-Out & Aggregation

- ◆ Cut-through architecture for high performance
- ◆ Two Virtual Channels for QoS

Design Tools & Documentation:

http://www.plxtech.com/products/pci_express/PEX8508/default.asp

Data Book, Design Notes, Product Brief
HSPICE Model, BSDL Model

Contact Information

PLX Technology, Inc.
870 Maude Ave.
Sunnyvale, CA 94085 USA
Tel: 1-800-759-3735
Tel: 1-408-774-9060
Fax: 1-408-774-2169
Applications Support: Local FAE
Product Marketing:
Touseef Bhatti tbhatti@plxtech.com
Web Site: www.plxtech.com

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