Gen3 PCIe Transparent Switch

Overview

Mobiveil’s PCI Transparent Switch is a highly flexible and configurable design targeted for end-point implementations in desktop, server, mobile, networking and telecom applications. The controller architecture is carefully tailored to optimize link utilization, latency, reliability, power consumption, and silicon footprint.

GPEX-SWITCH is part of Mobiveil’s PCI-Express (GPEX) family of IP solutions which includes End Point (GPEX-EP), Root Complex (GPEX-RC), Hybrid (GPEX-HY), Switch port Controller (GPEX-SW), GPEX-AXI Bridge (GPEX-AXI), GPEX-AHB Bridge (GPEX-AHB) and Advanced Switching (GPEX-AS) designs.

The controller’s simple, configurable and layered architecture is independent of application logic, PHY designs, implementation tools and, most importantly, the target technology. Mobiveil solution allows the licensees to easily migrate among FPGA, Gate array and Standard cell technologies optimally. Its flexible backend interface makes it easy to be integrated into wide range of applications. Mobiveil solution provides highly scalable bandwidth through configurable lanes, widths and frequencies.

GPEX-SWITCH leverages Mobiveil’s years of experience in PCI, PCI-X and HyperTransport technologies and the expertise in creating system validated IP solutions with RTL, synthesis, simulation, board and software elements to offer lowest risk in terms of compliance and interoperability.

Features

- Compliant to PCI Express base specification version 3.0, Oct 2011 Errata for 3.0 and backward compatible with PCI Express versions 2.0 and 1
- Compliant with PCI-to-PCI Bridge Architecture Specification Revision 1.2
- Architected for high link utilization and low latency
- Non-blocking architecture.
- 32/64/128/256 bit Datapath
- Each port can support a unique feature set.
- Completely handles PCI-Express ordering rules
- Implements flow control logic for both directions
- Optional AMBA Master and Slave Interface to the Application logic
- 8bit/16/32-bit Pipe interface for external ports on link side.
- Support for link re-configuration, programmable link width on multi-lane ports
- Supports parallel address decoding at each ingress port
- Advanced Error reporting for all switch ports and embedded endpoints
- Full PCI-PM and ASPM Support for L0s, L1
- Configuration access to internal ports and type-1/type-0 conversion for configuration transactions targeted to downstream devices
- Unsupported request and unexpected completion handling for both upstream and downstream traffic
- Round Robin and Strict Priority arbitration with starvation detection options for Port Arbitration

Highly Configurable  Technology Independent  System Validated
### Specifications

#### Configurable Options
- Maximum Link Width (x1, x2, x4, x8, x16)
- Maximum TLP data payload size supported (128B to 4KB)
- Data Path Widths (32, 64, 128, 256)
- Transmit Retry/Receive Buffer size
- Number of Virtual Channels
- Upstream port / downstream port
- Inclusion of specific sublayers etc.
- ASPM L1 / Wake support, Auxiliary power support
- Hot plug support

#### Design Attributes
- Highly modular and configurable design
- Layered architecture
- Fully synchronous design
- Supports both sync and async reset
- Clearly demarked clock domains
- Software control for key features
- Multiple loop backs for debug

#### Product Package
- Configurable RTL Code
- HDL based test bench and behavioral models
- Test cases
- Protocol checkers, bus watchers and performance monitors
- Configurable synthesis shell

#### Documentation
- Design Guide
- Verification Guide
- Synthesis Guide

### About Mobiveil

Mobiveil is a fast growing Technology company that specializes in creation of Intellectual Properties, Frameworks and Solutions for the Networking, Enterprise and Device Mobility markets. The Mobiveil team leverages decades of experience in delivering high-quality, production-proven, high-speed serial interconnect Silicon IP cores to the leading customers worldwide. With a highly motivated engineering team, dedicated integration support, flexible business models, strong industry presence through strategic alliances and key partnerships, Mobiveil solutions have added tremendous value to the customers in executing their marketing and engineering goals within budget and on time.

Mobiveil is headquartered in the Silicon Valley with engineering development centers located in Milpitas, CA, Chennai and Bangalore, India, and sales offices and representatives located in US, Europe, Israel, Japan, Taiwan and Peoples Republic of China.