

# Switchtec PFX PCIe Gen3 Fanout Switch Family

PM8536, PM8535, PM8534, PM8533, PM8532, and PM8531

The Switchtec PFX PCIe Gen3 Fanout Switch Family comprises high-reliability PCIe Base Specification 3.1-compliant switches supporting up to 96 lanes, 24 virtual switch partitions, 48 Non-Transparent Bridges (NTBs), hot- and surprise-plug controllers for each port, advanced error containment, and comprehensive diagnostics and debug capabilities.

Typical applications for the PFX include data center equipment, defense and industrial servers, workstations, test equipment, video production and broadcasting equipment, cellular infrastructure, access networks, metro networks, and core networking.

## Features

### High-Performance Non-Blocking Switches

- Up to 174 GB/s switching capacity
- 96-lane, 80-lane, 64-lane, 48-lane, 32-lane, and 24-lane variants
- Ports bifurcate from x2 to x16 lanes
- Up to 48 NTBs assignable to any port
- Logical Non-Transparent (NT) interconnect allows for larger topologies (up to 256 masters)
- Supports 1+1 and N+1 failover mechanisms
- NT address translation using direct windows and multiple sub-windows per BAR
- Supports multicast groups per port

### Error Containment

- Advanced Error Reporting (AER) on all ports
- Downstream Port Containment (DPC) on all downstream ports
- Poisoned TLP blocking
- Completion Timeout Synthesis (CTS) to prevent an error state in an upstream host due to incomplete non-posted transactions
- Hot- and surprise-plug controllers per port
- GPIOs configurable for different cable/connector standards

### PCIe Interfaces

- Passive, managed, and optical cables
- SFF-8644, SFF-8643, SFF-8639, OCUlink, and other connectors
- SHPC-enabled slot and edge connectors

### Diagnostics and Debug

- Transaction Layer Packet (TLP) generator for testing and debugging of links and error handling
- Real-time eye capture
- Any-to-any port mirroring for debug purposes
- External loopback at PHY and TLP layers
- Errors, statistics, performance, and TLP latency counters



## Highlights

- High-reliability PCIe: robust error containment, hot- and surprise-plug controllers per port, end-to-end data integrity protection, ECC protection on RAMs, high-quality, low-power SERDES
- Comprehensive diagnostics and debugging: PCIe generator and analyzer, per-port performance and error counters, multiple loopback modes, and real-time eye capture
- Significant power, cost, and board space savings with support for:
  - Up to 48 ports, 48 NTBs, and 24 virtual switch partitions
  - Flexible x2, x4, x8 and x16 port bifurcation with no restrictions on configuring ports as either upstream or downstream, or on mapping ports to NTBs

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## Peripheral I/O Interfaces

- Up to 11 Two-Wire Interfaces (TWIs) with SMBus support
- Up to 2 SFF-8485-compliant SGPIO ports
- Up to 109 parallel GPIO pins
- Up to 4 UARTs
- JTAG and EJTAG interface

## High-speed I/O

- PCIe Gen3 8 GT/s
- Supports PCIe-compliant link training and manual PHY configuration

## Power Management

- Active State Power Management (ASPM)
- Software controlled power management

## Chiplink Diagnostic Tools

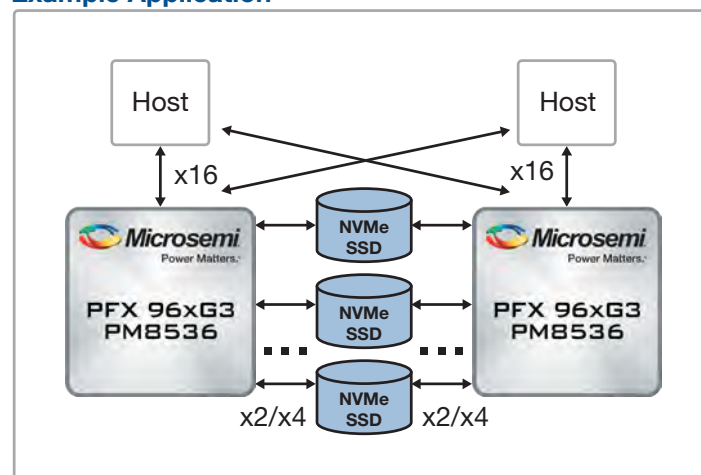
- Extensive debug, diagnostics, configuration, and analysis tools with an intuitive GUI
- Access to configuration data, management capabilities, and signal integrity analysis tools (such as real-time eye capture)
- Connects to device over in-band PCIe or sideband signals (UART, TWI, and EJTAG)

## Evaluation Kit

The evaluation kit is a device evaluation environment supporting multiple host and SSD interfaces. The following kits are available:

- PM5461-KIT — PSX/PFX 96/80/64xG3, 1-Slot, 16 HD Evaluation Kit (PMC-2151996)
- PM5462-KIT — PSX/PFX 48/32/24xG3, 3-Slot Evaluation Kit (PMC-2151645)

## Example Application



## Ordering Information

Product	Lanes	Ports/NTBs	Partitions	Hot-plug Controllers	Package	Ordering No.
PFX 96xG3 PCIe Fanout Switch	96	48	24	48	37.5 mm x 37.5 mm	PM8536B-FEI
PFX 80xG3 PCIe Fanout Switch	80	40	20	40	37.5 mm x 37.5 mm	PM8535B-FEI
PFX 64xG3 PCIe Fanout Switch	64	32	16	32	37.5 mm x 37.5 mm	PM8534B-FEI
PFX 48xG3 PCIe Fanout Switch	48	24	12	24	27.0 mm x 27.0 mm	PM8533B-F3EI
PFX 32xG3 PCIe Fanout Switch	32	16	8	16	27.0 mm x 27.0 mm	PM8532B-F3EI
PFX 24xG3 PCIe Fanout Switch	24	12	6	12	27.0 mm x 27.0 mm	PM8531B-F3EI



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