Switchtec™ PFX/PFX-I PCIe Gen3 Fanout Switch Families
PM853x PFX and PM857x PFX-I 96/80/64/48/32/24xG3 PCIe Gen3 Fanout Switches

The Switchtec PFX/PFX-I PCIe Gen3 fanout switch families comprise 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. The PFX-I Gen3 PCIe Switch supports the full feature set available on the PFX* and operates over an extended industrial temperature range of –40 °C ambient to 105 °C junction.

Typical applications include data center equipment, defense, 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
- PFX-I supports an extended industrial temperature range $T_A$: –40 °C to $T_J$: 105 °C

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

*Except for Adaptive Voltage Scaling (AVS).
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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. These kits can be used for evaluation of the Switchtec PCIe Fanout switches. Note that a 96-lane PCIe switch is populated on the evaluation kit. The following kit is available:
- PM5461-KIT—PFX/PFX-L/PSX/PAX 96/80/64xG3, 1-Slot, 16 HD Evaluation Kit (PMC-2151996)

Example Application

<table>
<thead>
<tr>
<th>Product</th>
<th>Lanes</th>
<th>Ports/NTBs</th>
<th>Partitions</th>
<th>Hot-plug Controllers</th>
<th>Package</th>
<th>PFX Ordering No.</th>
<th>PFX-I Ordering No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>96xG3 PCIe Fanout Switch</td>
<td>96</td>
<td>48</td>
<td>24</td>
<td>48</td>
<td>37.5 mm x 37.5 mm</td>
<td>PM8536B-FEI</td>
<td>PM8576B-FEI</td>
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<tr>
<td>80xG3 PCIe Fanout Switch</td>
<td>80</td>
<td>40</td>
<td>20</td>
<td>40</td>
<td>37.5 mm x 37.5 mm</td>
<td>PM8535B-FEI</td>
<td>PM8575B-FEI</td>
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<tr>
<td>64xG3 PCIe Fanout Switch</td>
<td>64</td>
<td>32</td>
<td>16</td>
<td>32</td>
<td>37.5 mm x 37.5 mm</td>
<td>PM8534B-FEI</td>
<td>PM8574B-FEI</td>
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<tr>
<td>48xG3 PCIe Fanout Switch</td>
<td>48</td>
<td>24</td>
<td>12</td>
<td>24</td>
<td>27.0 mm x 27.0 mm</td>
<td>PM8533B-F3EI</td>
<td>PM8573B-F3EI</td>
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<tr>
<td>32xG3 PCIe Fanout Switch</td>
<td>32</td>
<td>16</td>
<td>8</td>
<td>16</td>
<td>27.0 mm x 27.0 mm</td>
<td>PM8532B-F3EI</td>
<td>PM8572B-F3EI</td>
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<tr>
<td>24xG3 PCIe Fanout Switch</td>
<td>24</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>27.0 mm x 27.0 mm</td>
<td>PM8531B-F3EI</td>
<td>PM8571B-F3EI</td>
</tr>
</tbody>
</table>

Note: PFX T_Junction: 0 °C to 105 °C, PFX-I T_Ambient: –40 °C to T_Junction: 105 °C. PFX-I doesn’t support Adaptive Voltage Scaling (AVS).