



P4CG2BPi81 Bypass Server Adapter

Dual port Fiber 100 Gigabit Ethernet PCI Express Gen 4.0 Bypass Server Adapter Intel® E810 based.

Product Description

Enhance Your Network Performance with Silicom's 100G Intel® E810 Based Server Adapter

Silicom's P4CG2BPi81 Bypass Server Adapter 100 Gigabit Ethernet PCI Express Intel® E810 based is designed for Servers and high-end appliances. Silicom's P4CG2BPi81 Bypass Server Adapter 100G Intel® E810 based offer simple integration into any PCI Express X16 to 100 Gigabit Networks.



The performance is optimized so that system I/O is not the bottleneck in high-performance networking applications.

The Silicom's P4CG2BPi81 Bypass server adapter is targeted to inline network system that maintains network connectivity when system fails.

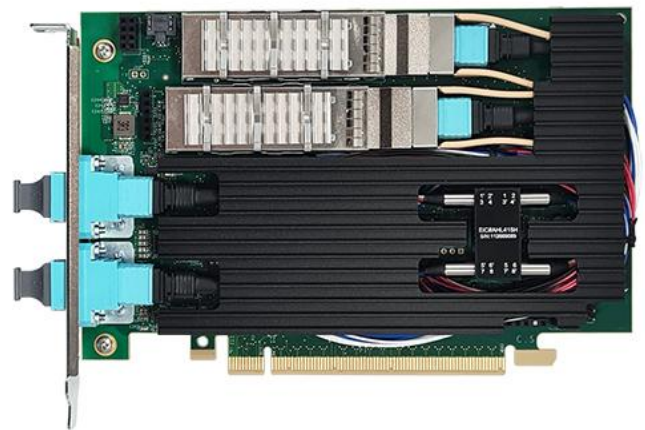
Flexible Modes of Operation: Normal, Bypass, and Disconnect on Silicom's P4CG2BPi81 Adapter

The Silicom's P4CG2BPi81 Bypass Server Adapter 100 Gigabit Ethernet PCI-e is based on Intel E810-CAM2 Ethernet controller with fully integrated two 100G Ethernet Ports, enhanced programmable packet processing pipeline, virtualization (Enhanced SR-IOV support with up to 256 VFs, backward compatibility VF driver support), new features for the communications market (fine grained scheduler, transmit head drop support, adjustment of credits according to different headers, enhanced QoS, enhanced burst control) and RDMA (iWARP and RoCEv2).

Silicom's P4CG2BPi81 Bypass Server Adapter 100 Gigabit Ethernet supports Normal, Bypass and Disconnect modes. In Normal mode, the ports are independent interfaces. In Bypass mode, all packets received from one port are transmitted to the adjacent port. In Disconnect mode, the adapter simulates switch / rout cable disconnection.

Silicom's 100 Gigabit Ethernet PCI-Express Bypass NICs: The Ideal Solution for High-Performance Servers

Silicom's P4CG2BPi81 Bypass Server Adapter can Bypass or disconnect its Ethernet ports on a host system failure, power off, or upon software request.



In Bypass mode, the connections of the Ethernet ports are disconnected from the system and switched over to the other port to create a crossed connection loop-back between the Ethernet ports. Hence, in bypass mode all packets received from one port are transmitted to the adjacent port and vice versa. This feature enables to bypass a failed system and provides maximum up time for the network.

Silicom's P4CG2BPi81 Bypass Server Adapter Intel® E810 based includes an on board WDT (Watch Dog Timer) controller. The adapter's software drivers or software application can write commands to the on board WDT controller. The adapter's software drivers, WDT controller and the Bypass circuitry provide an interface that control and manage the mode of the adapter.

Silicom's 100 Gigabit Ethernet PCI-Express Bypass NICs are the ideal solution for implementing multiple network segments, mission-critical high-powered networking applications and environments within high performance servers.

Optimized to work with Intel Xeon Scalable processor.

Key Features

Bypass / Disconnect:

- Bypass / Disconnect Ethernet ports on Power Fail, System Hangs or Software Application Hangs.
- Software programmable Bypass, Disconnect or Normal Mode.
- On Board Watch Dog Timer (WDT) Controller.
- Software programmable time out interval.
- Software Programmable WDT Enable / Disable counter.
- Software programmable Bypass Capability Enable / Disable.
- Software Programmable Disconnect Capability Enable / Disable.
- Software Programmable mode (Bypass, Normal or Disconnect mode) at Power up.
- Software Programmable mode (Bypass, Normal mode) at Power off.
- Independent Bypass operation in every two ports.
- Emulates standard NIC

LAN and Virtualization Features:

- 100Gbps throughput (each of Tx and Rx)
- Parses up to 504B from packet header
- 768 switch ports (VSIs)
- Programmable forwarding rules
- Virtualization
 - Host virtualization via VMQ and SR-IOV
 - 256 SR-IOV Virtual Functions
 - Stateless offloads for tunneled packets (network virtualization support)
 - Malicious VF protection
- RDMA
 - iWARP and RoCE v2
 - 256K Queue Pairs (QPs)
 - Send Queue Push Mode
- QoS
 - WFQ Transmit scheduler with 9 programmable layers
 - Pipeline sharing and starvation avoidance
 - Up to 32 Congestion Domains in the Tx and Rx paths
 - QoS via 802.1p PCP or Differentiated services DSCP value
 - Rx Packet buffer supports at least 3 no-drop flow control events, shared among ports

Host Interface:

- PCIe x16 lanes from/to host via gold fingers of edge card
- Support PCI Express Base Specification Revision 4.0, 16GT/s, 8GT/s, 5GT/s or 2.5GT/s

Technical Specifications

-ZS4: Fiber 100GBASE-SR4 Ethernet Technical Specifications:	
IEEE Standard / Network topology:	Fiber Gigabit Ethernet, 100GBase-SR4 (850nm)
Data Transfer Rate:	103.125GBd
Cables and Operating distance:	Multimode fiber:
Up to:	62.5um, (OM4) 100m
Optical Output Power:	Typical: -1.55 dBm Minimum: -8.4 dB * being defined by IEEE 802.3bm
Optical Receive Sensitivity:	Typical: -8.94 dBm Maximum: -5.2 dBm * being defined by IEEE 802.3bm
-ZL4: Fiber 100GBASE-LR4 Ethernet Technical Specifications	
IEEE Standard / Network topology:	Fiber 100Gigabit Ethernet, 100GBASE-LR4 (1310nm)
Data Transfer Rate:	103.1GBd
Cables and Operating distance:	Single-Mode: 10km
Up to:	
Optical Output Power:	Minimum: -4.3 dBm
Optical Receive Sensitivity:	Maximum: -10.6 dBm
Operating Systems Support	
Operating system support:	Linux
General Technical Specifications	
Interface Standard:	PCI-Express Base Specification Revision 4.0 (16 GTs)
Board Size:	Standard height half length add-in card 167.64mm X 111.15mm (6.60"X 4.376")
PCI Express Card Type:	X16 Lane
PCI Express Voltage:	+12V $\pm$ 8% +3.3V AUX $\pm$ 9%
External Voltage from external Connector:	+12V $\pm$ 8%
PCI Connector:	Gold Finger: X16 Lane
Controller:	Intel E810-CAM2
Holder:	Metal Bracket
Power Consumption	ZS4- 25W maximum , ZL4 -27W maximum
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 40°C (32°F – 104°F)
Storage:	-40°C–65°C (-40°F–149°F)
Regulation:	Card shall meet CE, FCC Class B, ROHS requirements.

LEDs	
LEDs:	(1) Link 100/25/10 Gbps LED per port: 100 Gbps: Link : Turns on Green <100 Gbps: Link : Turns on Yellow (1) Activity LED per port: Blinks Green (KINGBRIGHT, P/N KPBA-3010SYKCGKC, or compatible. Id : 590 nm) (1) Bi-color LED per segment (2 ports): Normal : Off Bypass : Turns on Green (KINGBRIGHT, P/N KPBA-3010SYKCGKC, or compatible. Id : 570 nm) Disconnect : Turns on Yellow (KINGBRIGHT, P/N KPBA-3010SYKCGKC, or compatible. Id : 590 nm)
LEDs location:	LEDs are located on the PCB, visible via holes in the metal bracket. Each green Link/Act 100/25/10 LED (1 LED per port) is located below its own connector port. The bi-color LED for Bypass/Disconnect is located between the 2 ports.
Connectors:	(2) MTP/MTP (ZS4) (2) LC/LC (ZL4)

Functional Description

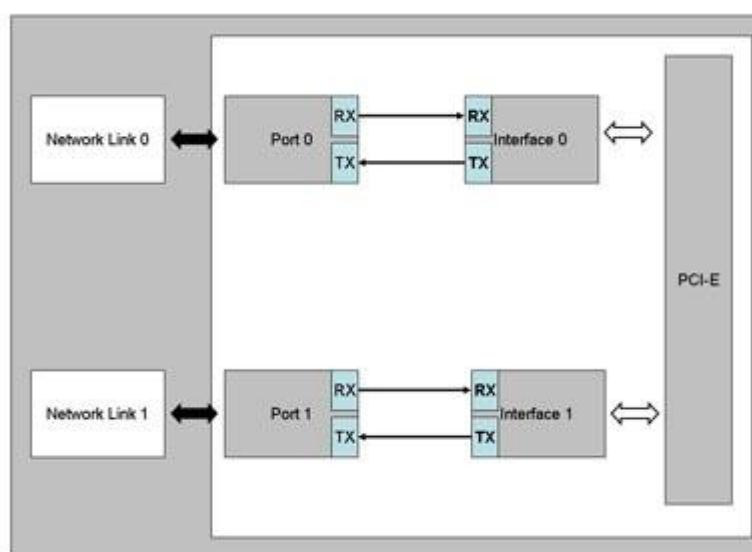
Normal/Bypass/Disconnect Mode of operation

Silicom's Bypass adapter supports the following mode states: Normal/inline, Bypass/Fail-To-Wire and Disconnect modes.

Normal/Inline mode

In Normal mode, the ports are independent interfaces (see Figure 1: Normal mode, one Bypass pair is illustrated).

Figure 1: Normal Mode Functional Block Diagram

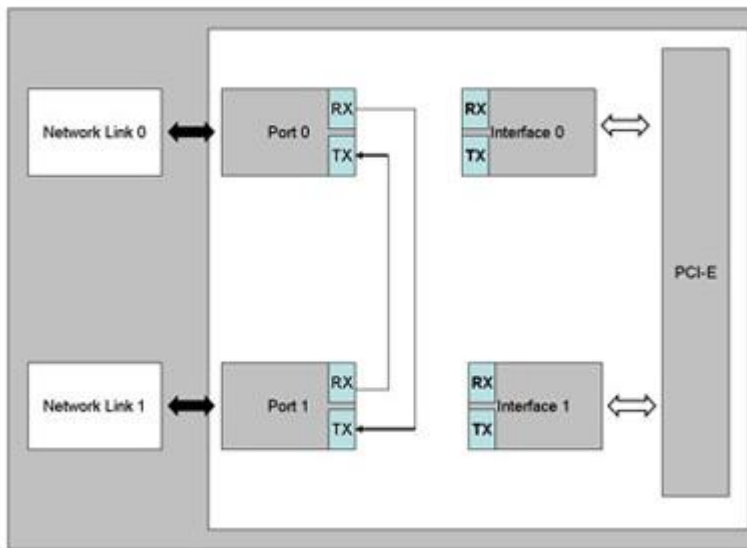


Bypass/Fail-To-Wire mode

In Bypass mode, the connections of the Ethernet network ports are disconnected from the interfaces and switched

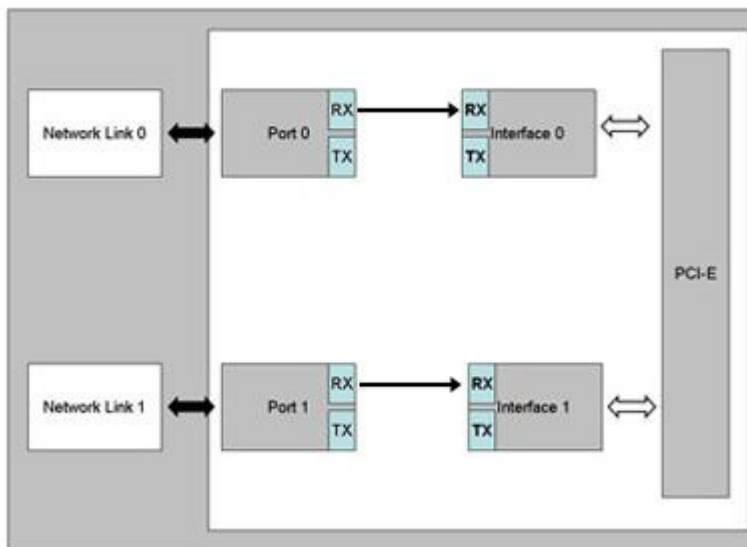
over to the other port to create a crossed connection loop-back between the Ethernet ports. The connections of the interfaces are left unconnected. (See Figure 2: one Bypass pair illustrated)

Figure 2: Bypass Mode Functional Block Diagram



Disconnect mode

In Disconnect mode, the transmit connections of the interfaces are disconnected from the ports. The switch / router connected to the adapter does not detect link partner (See Figure 3):



Bypass/Disconnect Features

Silicom Bypass server adapters include an on board Controller that can Bypass the Ethernet ports on host system failure like Power Off, System hangs or software application hangs. The software programmable Watch Dog Timer (WDT) Controller detects a host system fails and it will Bypass automatically the Ethernet ports after programmable time out interval. The WDT Controller can be software programmable enabled or disabled.

The drivers of the adapters and the Bypass circuitry provides an interface that control and management the mode of the adapter. The adapter software driver or software application can writes commands to the on board controller. The on board controller processes the commands and activates the bypass circuitry accordingly.

After power up the default mode of the adapter is to be in Bypass mode. After driver is loaded, the adapter software driver or application can set the card to a Normal mode. After the Host system issues reset, setting of Bypass controller and circuitry are reserved.

Silicom's Bypass server adapter supports software programmable to select Normal, Bypass or Disconnect modes.

Silicom's Bypass adapters supports Disable Bypass, Disable Disconnect capabilities; hence, if those adapters receive Disable Bypass capability / Disable Disconnect commands, the adapter does not Bypass / does not Disconnect its Ethernet ports, The Disable Bypass Capabilities are reserved also after power off. This feature enables to emulate a standard NIC.

Key Features

- All modes of operation are fully software configured with a well-defined and easy to use API.
- Disable bypass/Disconnect for a standard NIC emulation and operation, retained even with power cycle
- Range of Watchdog timer timing, configurable for detecting appliance failure.
- Watchdog timer reset function by application or self-reset by the product bypass driver
- Easy to read product status and product features capabilities
- Fast switching between mode with less than 10mS of transit time
- Compatible with all Silicom bypass products, one driver set and command set for all products.

Order Information

P/N	Description	Notes
P4CG2BPI81-ZS4	Dual port Fiber (SR4) 100 Gigabit Ethernet PCI Express Gen 4.0 Bypass Server Adapter	RoHS Compliant, Gen4 x 16, based on Intel E810-CAM2
P4CG2BPI81-ZL4	Dual port Fiber (LR4) 100 Gigabit Ethernet PCI Express Gen 4.0 Bypass Server Adapter	RoHS Compliant, Gen4 x 16, based on Intel E810-CAM2