Silicom Connectivity Solutions

PE340G2BPI71 Bypass Server Adapter

Dual Port Fiber 40 Gigabit Ethernet PCI Express Bypass Server Adapter Intel® XL710 Based

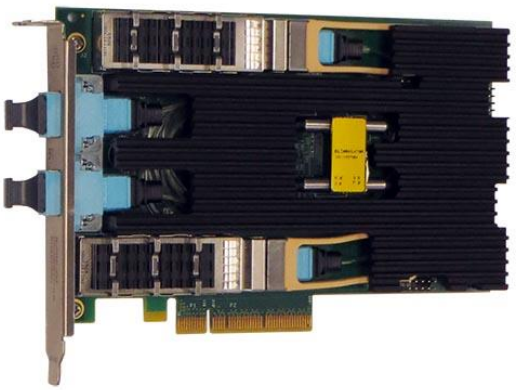
Product Description

Silicom's 40 Gigabit Ethernet PCI Express Bypass server adapters are designed for Servers and high-end appliances.

The Silicom 40 Gigabit Ethernet PCI Express Server Bypass adapters offer simple integration into any PCI Express X8 to 40Gigabit Networks. The performance is optimized so that system I/O is not the bottleneck in high-performance networking applications.

The Silicom 40 Gigabit Ethernet PCI Express Bypass server adapters are based on Intel XL710 Ethernet controller with two fully integrated Gigabit Ethernet Media Access Control (MAC) and XLPPI Interface. In addition to managing MAC and PHY Ethernet layer functions, the controller manages PCI Express packet traffic across its transaction, link, and physical/logical layers. Using hardware acceleration, the controller offloads tasks from the host, such as TCP/UDP/IP checksum calculations and TCP segmentation.

Silicom's 40 Gigabit Ethernet PCI-Express Bypass Server adapters are the ideal solution for implementing multiple network segments, mission-critical high-powered networking applications and environments within high performance servers. 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 40 Gigabit Ethernet PCI Express Bypass server adapters include 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.

Key Features

- Bypass
- Bypass Ethernet ports on Power Fail, System Hangs or Software Application Hangs.
- Software programmable Bypass 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 mode Bypass, Normal mode at Power up
- Software Programmable mode Bypass, Normal mode) at Power off
- Independent Bypass operation in every two ports
- Emulates standard NIC

Performance Features:

- Support for jumbo frame up to 9.5KB
- Flow control support
- Priority Flow Control (draft IEEE 802.1Qbb)
- Enhanced Transmission Selection (draft IEEE802.1az)
- Statistics management and RMON
- 802.1q VLAN support
- DCB/DCB-X support
- Message Signal interrupts (MSI-X)
- Storage – Enabling competitive performance with native OS intelligent offload solutions, including NAS, iSCSI and FCoE

Host Interface:

- PCI Express X8 lanes
- Support PCI Express Base Specification 3.0 (8GT/sec)

LAN and Virtualization Features:

- Network Virtualization offloads for VXLAN and NVGRE
- Unified Networking Providing a single wire for LAN and storage: NAS (SMB, NFS) and SAN (iSCSI, FCoE)
- Virtual Bridging Support – VEPA/802.1Qbg, BPE/802.1Qbh
- Physical Functions – Up to 8 per port, up to 16 per device
- Support for 256 Virtual Device Queues (VMDq) per port
- Virtualization – Alleviating hypervisor I/O bottlenecks by providing flow separation for Virtual Machines (VMs)
- TCP/IP/L2 features:
- Receive Side Scaling (RSS)
- Large Send Offload (LSO)
- TCP/UDP/IP/SCTP Checksum Offload
- IPV4, IPV6

Technical Specifications

Bypass Specifications	
WDT Interval (Software Programmable):	3,276,800 mSec (3,276.8 Sec): Maximum 100 mSec (0.1 Sec) : Minimum WDT Interval = (2^wdt_interval_parameter)*(0.1) sec. wdt_interval_parameter: { Valid Range: 0-15}
– QS41: Fiber 40GBASE-SR4 Ethernet Technical Specifications:	
IEEE Standard / Network topology:	Fiber 40Gigabit Ethernet, 40GBASE-SR4 (840 to 860 nm LAN PHY). IEEE 802.3ba
Data Transfer Rate:	10.5 GBd per lane
Cables and Operating distance:	50um, (OM3) 1500 MHz*Km, 0.5 to 100 m 50um, (OM4) 3500 MHz*Km, 0.5 to 150 m
Output Transmit Power:	Maximum: 2.4 dBm per lane Minimum: -7.6 dBm per lane
Optical Receive Sensitivity:	Minimum: -5.4 dBm
Maximum Input Power:	Maximum: 2.4 dBm
– QS43: Fiber 40GBASE-SR4 Ethernet Technical Specifications:	
IEEE Standard / Network topology:	Fiber 40Gigabit Ethernet, 40GBASE-SR4 (840 to 860 nm LAN PHY). IEEE 802.3ba
Data Transfer Rate:	10.5 GBd per lane
Cables and Operating distance:	50um, (OM3) 1500 MHz*Km, 0.5 to 300 m 50um, (OM4) 3500 MHz*Km, 0.5 to 400 m
Output Transmit Power:	Maximum: 0.5 dBm per lane Minimum: -7.5 dBm per lane
Optical Receive Sensitivity:	Minimum -7.5dBm
Maximum Input Power:	Maximum: 2.4 dBm
-QL4: Fiber 40GBASE-LR4 Ethernet Technical Specifications:	
IEEE Standard / Network topology:	Fiber 40Gigabit Ethernet, 40GBASE-LR4 (1264.5nm – 1277.5nm ; 1284.5nm – 1297.5nm ; 1304.5nm – 1317.5nm ; 1324.5nm – 1337.5nm LAN PHY). IEEE 802.3ba
Data Transfer Rate:	10.3125 GBd per lane
Cables and Operating distance:	SMF-28, 10Km
Output Transmit Power:	Maximum: 2.3 dBm per lane Minimum: -7.0dBm per lane
Optical Receive Sensitivity:	Maximum: -9.6 dBm
Maximum Input Power:	Maximum: 2.3 dBm
Operating Systems Support	
Operating system support:	Windows Linux

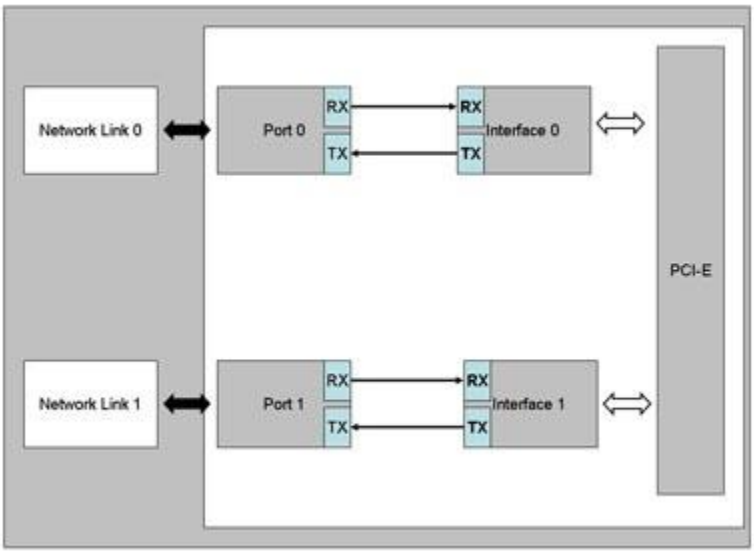
General Technical Specifications	
Interface Standard:	PCI-Express Base Specification Revision 3.0 (8 GT/sec)
Board Size:	167.6mm X111.17mm(6.600″ X 4.377″) PCB thickness is 0.062 inch
PCI Express Card Type:	X8 Lane
PCI Express Voltage:	+12V +- 8%
PCI Connector:	X8 Lane
Controller:	Intel XL710
Holder:	Metal Bracket
Weight:	330 gr (11.641oz)
Power Consumption –QS41:	5.28W
Power Consumption –QS43:	5.28W
Power Consumption –QL4:	8.16W
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 45°C (32°F – 113°F)
Storage:	-40°C–65°C (-40°F–149°F)
EMC Certifications:	FCC 47CFR Part 15:2013, Subpart B Class B Conducted emissions Radiated emissions EN 55022: 2010, Class B Conducted disturbance at mains terminals Conducted disturbance at telecommunication port Radiated disturbance EN 61000-3-2: 2006+A1(09)+A2(09) Harmonic current emissions EN 61000-3-3: 2008 Voltage fluctuations and flicker EN 55024: 2010 Immunity to electrostatic discharge (ESD) Radiated immunity to radio frequency electromagnetic field Conducted immunity to electrical fast transients / bursts (EFT/ B) Conducted immunity to voltage surges Conducted immunity to disturbances induced by radio frequency field Conducted immunity to voltage dips and short interruptions
MTBF*:	124 Years According to Telcordia SR-332 Issue 2 Environmental condition – GB (Ground, Fixed, Controlled) Ambient temperature 40°C
LEDs	
LEDs:	Link/Act 40G: Turns on Green , Blink on Activity (KINGBRIGHT, P/N KPHB-1608CGKSYKC, or compatible. λd : 574 nm) Bypass: Turn on Green (KINGBRIGHT, P/N KPBA-3010SYKCGKC, or compatible. λd : 574 nm)
LEDs location:	LED is located on the PCB, visible via holes in the metal bracket holder
Connectors:	(2) MTP/MTP (-QS41/ -QS43) (2) LC/LC (-QL4)

Functional Description

Silicom's Bypass Server adapters support Normal, Bypass modes.

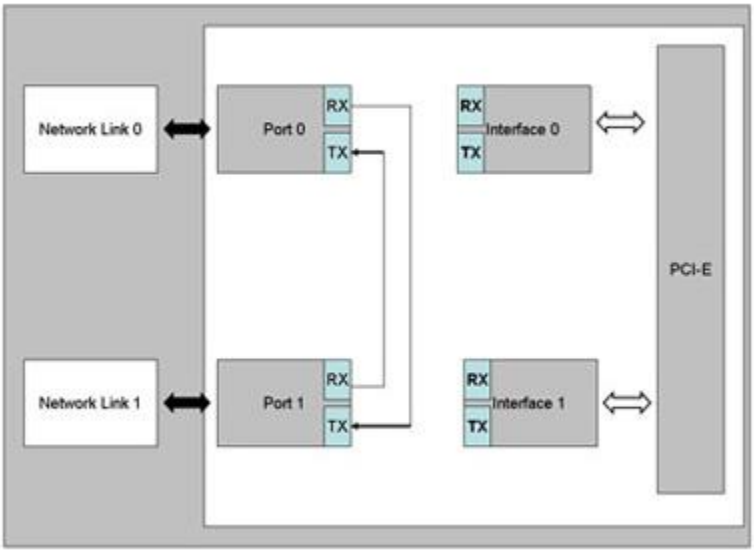
In Normal mode, the ports are independent interfaces (see Figure 1: Normal mode, one Bypass pair is illustrated).

Figure 1: Normal Mode Functional Block Diagram



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 not connected. (See Figure 2: one Bypass pair illustrated)

Figure 2: Bypass Mode Functional Block Diagram



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.

Silicom Bypass server adapters support software programmable to select Bypass or Normal mode. In Normal mode, the ports of the adapters remain independently operational.

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 Bypass server adapters support Disable Bypass Capability; hence, if those adapters receive Disable Bypass Capability command, the adapter does not Bypass its Ethernet ports, in this state the four Ethernet ports are independent. The Disable Bypass Capability state is reserved also after power off. This feature enables to emulate a standard NIC.

Silicom Bypass server adapters can be set to Bypass or Normal mode at power up. This setting programmable and is reserved also after power off.

Order Information

P/N	Description	Notes
PE340G2BPI71-QS41	Fiber (SR4) 40 Gigabit Ethernet PCI Express Bypass Server Adapter	X8 Gen3, Based on Intel XL710BM2, on board support for Fiber SR4 up to length 100m on OM3 MMF, RoHS compliant
PE340G2BPI71-QS43	Fiber (SR4) 40 Gigabit Ethernet PCI Express Bypass Server Adapter	X8 Gen3, Based on Intel XL710BM2, on board support for Fiber SR4 300m on OM3 MMF, RoHS compliant
PE340G2BPi71-QL4	Fiber (LR4) 40 Gigabit Ethernet PCI Express Bypass Server Adapter	X8 Gen3, Based on Intel XL710BM2, on board support for Fiber LR4, RoHS compliant

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