PE2G2BPFI35

Dual Port Fiber Gigabit Ethernet PCI Express Bypass Server Adapter Intel® i350AM4 Based

Product Description

Silicom's Dual Port Fiber Gigabit Ethernet PCI Express Bypass Server adapter is PCI-Express X4 Fiber Gigabit Ethernet network interface card that is based on a single chip, non-Bridged dual port GBE controller. Silicom's Dual Port Gigabit Ethernet Bypass server adapter supports Normal, Disconnect and Bypass modes. In Normal mode, the ports are independent interfaces.

In Bypass mode, all packets received from one port are transmitted to adjacent port. In Disconnect mode, the adapter simulates switch / rout cable disconnection. 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.

In Disconnect mode, the adapter simulates switch / router cable disconnection. In Disconnect mode, the switch / router does not detect link partner of the adapter. Silicom's Dual Port Fiber 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.

Silicom's Dual Port Fiber Gigabit Ethernet PCI Express Bypass Server adapter is the ideal solution for implementing multiple network segments, mission-critical high-powered networking applications and environments within high performance servers.

Silicom's Dual Port Fiber Gigabit Ethernet Bypass Server adapter is based on Intel i350 Dual port Gigabit Ethernet MAC+PHY of Intel Controller. The Silicom i350 support PCI-SIG Single-Root I/O virtualization and sharing specification (SR-IOV).

Key Features

Performance Features:

- 8 Transmit and 8 Receive queues per port

- Up to 8 queues of Receive Side Scaling (RSS) minimize CPU utilization across multiple processor systems

- Support PCI-SIG Single-Root I/O virtualization Rev 1.1

  o Support for up to 8 virtual function (VFs)

  o Partial replication of PCI Configuration space

- Support for 8 pools (single queue) of virtual machine Device Queues (VMDq) per port

- Support Direct Cache Access (DCA)

- Support Intel I/O Acceleration Technology v3.0

- TSO interleaving for reduced latency

- Minimized device I/O interrupts using MSI and MSI-X

- UDP, TCP and IP checksum offload

- UDP and TCP transmit segmentation offload (TSO). machine

- SCTP receive and transmit checksum offload

- Packet interrupt coalescing timers (packet timers) and absolute-delay interrupt timers for both transmit and receive operation

- EEE (IEEE 802.3az) for reduced power consumption during low link utilization periods

Bypass:

- 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

Fiber Gigabit Ethernet 1000Base-SX:

- Independently Fiber Gigabit Ethernet channel/s support Gigabit Ethernet 1000Base-SX

- Small Form Factor (SFF) LC Connectors

Fiber Gigabit Ethernet 1000Base-LX:

- Independently Fiber Gigabit Ethernet channel/s support Gigabit Ethernet 1000Base-LX

- Small Form Factor (SFF) LC Connectors

Common Key features:

- Support PCI Express Base Specification 2.1 (5 GTs)

- High performance, reliability, and low power use in Intel i350 Dual integrated MAC + PHY and SERDES chip Controllers

- Ultra deep, packet buffer per channel lowers CPU utilization

- Hardware acceleration that can offload tasks from the host processor. The Controllers can offload TCP/UDP/IP checksum calculations and TCP segmentation

- Server class reliability, availability and performance features:
  - Link Aggregation and Load Balancing

- Priority queuing – 802.1p layer 2 priority encoding

- Virtual LANs –802.1q VLAN tagging

- Jumbo Frame (9.5KB)

- 802.x flow control

- Multicast/ broadcast Packet replication

- Supports Vital Product Data (VPD)

- LEDs indicators for link/Activity/bypass/disconnect status

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}
Fiber Gigabit Ethernet Technical Specifications – (1000Base-SX) Adapters	
IEEE Standard / Network topology:	Fiber Gigabit Ethernet, 1000Base-SX (850nM)
Data Transfer Rate:	2000Mbit/s in full duplex mode per port
Cables and Operating distance:	Multimode fiber: 137m maximum at 62.5 um ** ** Theoretical Distance – Defined as half a distance as stated by the IEEE 802.3 standard
Optical Output Power:	Normal Mode (Bypass Off): Minimum: -10.9 dBm
Optical Receive Sensitivity:	Normal Mode (Bypass Off) Maximum: -20 dBm
Insertion Loss:	Bypass Mode: Insertion loss (Optical Power attenuation between TX to RX)

	Maximum 1.6 dB
Fiber Gigabit Ethernet Technical Specifications – (1000Base-LX) Adapters:	
IEEE Standard / Network topology:	Fiber Gigabit Ethernet, 1000Base-LX (1310nM)
Data Transfer Rate:	2000Mb/s in full duplex mode per port
Cables and Operating distance:	Single-Mode fiber: 9um 2500m maximum at 9um ** ** Theoretical Distance – Defined as half a distance as stated by the IEEE 802.3 standard
Optical Output Power:	Normal Mode (Bypass Off): Minimum: -10.8 dBm (-9.5-0.3-1)
Optical Receive Sensitivity:	Normal Mode (Bypass Off) Maximum: -20 dBm
Insertion Loss:	Bypass Mode: Insertion loss (Optical Power attenuation between TX to RX) Maximum 1.6 dB
Operating Systems Support	
Operating system support:	Linux
General Technical Specifications	
Interface Standard:	PCI-Express Base Specification Revision 2.1 (5 GTs)
Board Size:	Low profile short add-in card: 167.64mm X 68.91mm (6.60"X 2.713")
PCI Express Card Type:	X4 Lane
PCI Express Voltage:	+3.3V +-9%, +12V +- 8%
PCI Connector:	Gold Finger: X4
Controller:	Intel i350AM4
I/O:	LC located on internal bracket

Holder:	Metal Bracket: Full Height/Low profile Height
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 Part 15, Subpart B Class A Conducted Emissions Radiated Emissions CE EN 55022: 1998 Clas Amendments A1: 2000; A2: 2003 Conducted Emissions Radiated Emissions CE EN 55024: 1998 Amendments A1: 2000; A2: 2003 Immunity for ITE Amendment A1: 2001 CE EN 61000-3-2 2000, Class A Harmonic Current Emissions CE EN 61000 3-3 1995, Amendment A1: 2001 Voltage Fluctuations and Flicker CE IEC 6100-4-2: 1995 ESD Air Discharge 8kV. Contact Discharge 4kV. CE IEC 6100-4-3:1995 Radiated Immunity (80-1000Mhz), 3V/m 80% A.M. by 1kHz CE IEC 6100-4-4:1995 EFT/B: Immunity to electrical fast transients 1kV Power Leads, 0.5Kv Signals Leads CE IEC 6100-4-5:1995 Immunity to conductive surges COM Mode; 2kV, Dif. Mode 1kV CE IEC 6100-4-6:1996 Conducted immunity (0.15-80 MHz) 3VRMS 80% A.M. By 1kHz CE IEC 6100-4-11:1994 Voltage Dips and Short Interruptions V reduc >95%, 30% >95% Duration 0.5per, 25per, 250per

| **LEDs**	
LEDs:	(2) LEDs per port Link/Act : Left LED – Turns on link (Yellow), Right LED – Blinks on activity (Green) Between each 2 ports : Link Speed / Bypass / Disconnect : Turns off on Normal link.

	Yellow on Disconnect Green on Bypass
LEDs location:	LEDs are located on the PCB, visible via holes in the metal bracket. Each yellow and green link /act LEDs are located above their own LC connector port- visible by light pipes. Speed link/bypass/disconnect LED per pair ports is located between ports – visible by light pipes
Connectors:	(2) LC

Functional Description

Silicom's Dual Port Bypass adapter supports Normal, Bypass and Disconnect modes. In Normal mode, the ports are independent interfaces
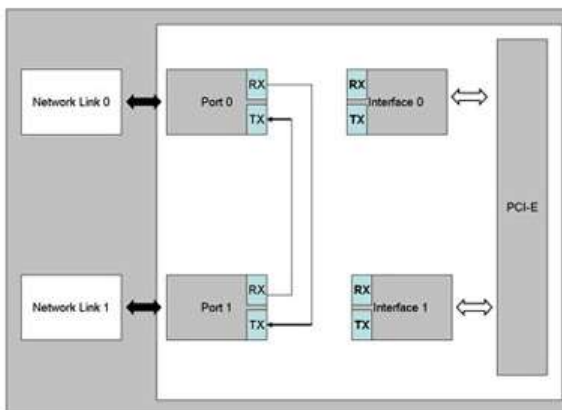
(see Figure 1: Normal mode, one Bypass pair is illustrated).

**Figure 1: Normal Mode Functional Block Diagram**
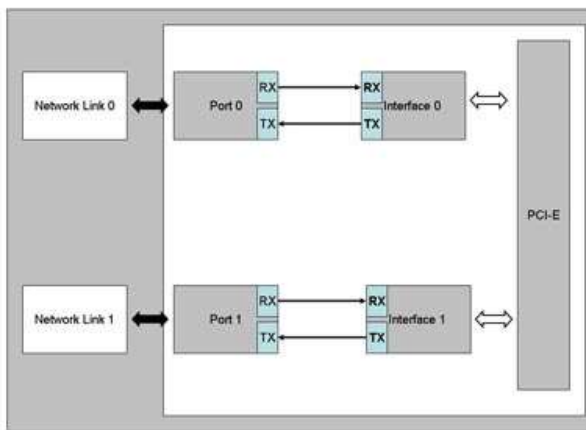
In Bypass mode, the connections of the Ethernet network ports are disconnected from the interfaces and switched over to the other port to create a crossed connection loop-back between the Ethernet ports. The connections of the interfaces are left unconnected. (See Figure 2: one Bypass pair illustrated)

Figure 2: Bypass Mode Functional Block Diagram

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In Disconnect mode, the transmit connections of the Ethernet network ports are Disconnected from the interfaces. (See Figure 3: one Bypass pair illustrated)

Figure 3: Disconnect Mode Functional Block Diagram
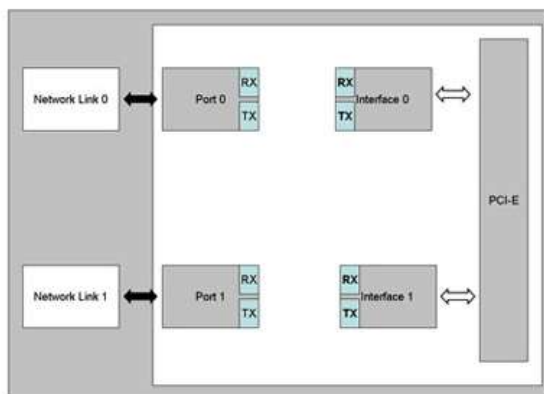
Silicom's Dual Port Fiber Gigabit Ethernet Bypass server adapter supports software programmable to select Normal, Bypass or Disconnect modes.

Silicom's Dual Port Fiber Gigabit Ethernet supports Disable Bypass, Disable Disconnected 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.

Silicom's Dual Port Fiber Gigabit Ethernet supports Disable supports setting the default mode at power up and power off. Those setting are reserved also after power off.

Order Information

P/N	Description	Notes
PE2G2BPFI35-SD	Dual Port Fiber (SX) Gigabit Ethernet PCI Express Bypass Server Adapter	X4, Based on Intel i350AM2,RoHS compliant, with Bypass and Disconnect
PE2G2BPFI35-LX-SD	Dual Port Fiber (LX) Gigabit Ethernet PCI Express Bypass Server Adapter	X4, Based on Intel i350AM2,RoHS compliant, with Bypass and Disconnect

Model P/N -SD

-SD: Side Driver

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