PE2G6BPI35

Six Port Copper Gigabit Ethernet PCI Express Bypass Server Adapter Intel® i350AM4 Based

Product Description

Silicom's Six Port Copper Gigabit Ethernet PCI Express Bypass Server adapter is PCI-Express X8 network interface card that contains six Gigabit SFP ports on a PCI-Express adapter. 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 Six Port Copper Gigabit Ethernet PCI Express Bypass Server adapter 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 Six Port Copper 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 Six Port Copper Gigabit Ethernet PCI Express Bypass Server adapter is based on Intel i350AM4 Quad port Gigabit Ethernet MAC+PHY and Intel i350AM2 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

Copper Gigabit Ethernet 1000Base-T :

- Independently copper Gigabit Ethernet channels support four Gigabit Ethernet (1000Base-T), Fast Ethernet (100Base-Tx) and Ethernet (10Base-T)

- Triple speed 1000Mbps (1000Base-T), 100 Mbps (100Base-Tx) and 10 Mbps (100Base-T) operation

- Nway auto negotiation automatic sensing and switching between 1Gbps full duplex and 100 / 10 Mbps operations Simplex or Full Duplex

- RJ-45 female connectors

Common Key features:

- Support PCI Express Base Specification 2.1 (5 GTs)

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

- Ultra deep, packet buffer per channel lowers CPU utilization

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- 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 – 802.1 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/Speed/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}
Copper Gigabit Ethernet Technical Specifications – (1000Base-T) Adapters:	
IEEE Standard / Network topology:	Gigabit Ethernet, 1000Base-T Fast Ethernet, 100Base-TX Ethernet, 10Base-T
Full duplex / Simplex:	Support both Simplex & Full duplex operation in all operating speeds
Auto negotiation:	Auto-negotiation between Full duplex and simplex operations and between 10Mb/s 100Mb/s speeds and duplex 1000Mb/s.
Data Transfer Rate:	1000 Mb/s, 100 Mb/s and 10 Mb/sec in simplex mode per port. 2000Mb/s 200 and 20 Mb/s in full duplex mode per port.
Cables and Operating distance:	10Base-T Category 3, 4, or 5 maximum 50m * 100Base-Tx Category 5 maximum 50m * 1000Base-T Category 5E maximum 50m * *Theoretical Distance – Defined as half a distance as stated by the IEEE 802.3 standard

Operating Systems Support	
Operating system support:	Linux

General Technical Specifications	
Interface Standard:	PCI-Express Base Specification Revision 2.1 (5 GTs)
Board Size:	Standard height short add-in card: 167.64mm x 111.15mm (6.6"X 4.376")
PCI Express Card Type:	X8 Lane / Gen2 5GTps
PCI Express Voltage:	+12V +- 8%
PCI Connector:	Gold Finger: X8
Controller:	Intel i350AM4 and Intel i350AM2
Weight:	230 gram (8.113 oz)
Power Consumption:	Normal mode: 10.44W, 0.87A at 12V: Typical all ports operate at 1000Mb/s. 8.28W, 0.69A at 12V: Typical all ports operate at 100Mb/s. 7.92W, 0.66A at 12V: Typical all ports operate at 10Mb/s. 7.08W, 0.59A at 12V: Typical No link at all ports. Bypass mode: 7.08W, 0.59A at 12V: Typical Bypass Mode Disconnect mode: 7.08W, 0.59A at 12V: Typical Bypass Mode
Holder:	Metal Bracket: Full 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 Class A Amendments A1: 2000; A2: 2003 Conducted Emissions Radiated Emissions

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	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
MTBF:	81(Years) *According to Telcordia SR-332 Issue 1 Environmental condition – GB (Ground, Fixed, Controlled). Ambient temperature – 25°C. Temperature rise of 15°C above the system ambient temperature was assumed for the cards components

LEDs

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LEDs:	(2) LEDs per port Link/Act LED : Turns on link (Green), Blinks on activity (Green) Link Speed/Bypass/Disconnect LED: Turns on Yellow 1G Link. Turns on Green 100M Link Blink Yellow on Disconnect Blink Green on Bypass
LEDs location:	LEDs are integrated with the RJ-45 connector.
Connectors:	(6) Shielded RJ-45

Functional Description

Silicom's Six 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**
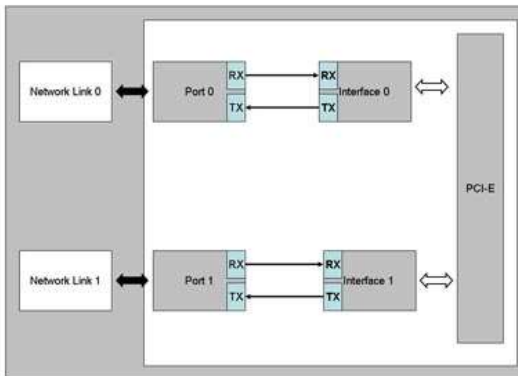
In Bypass mode, the connections of the Ethernet network ports are Disconnected from the interfaces and switched over to the other port to create a crossed connection loop-back between the Ethernet ports. The connections of the interfaces are left not connected. (See Figure 2: one Bypass pair illustrated)

Figure 2: Bypass Mode Functional Block Diagram
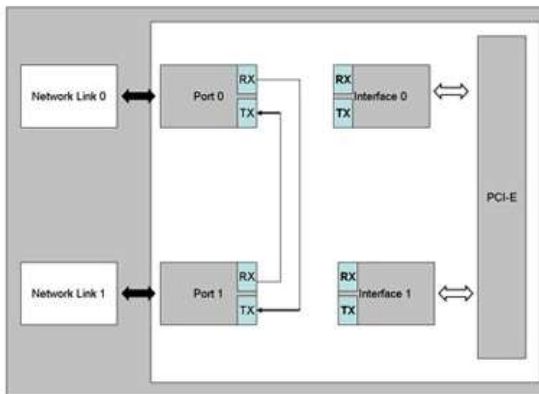
In Disconnect mode, the transmit connections of the Ethernet network ports are Disconnected from the interfaces. (See Figure 3: one Bypass pair illustrated)

Figure 3: Disconnect Mode Functional Block Diagram

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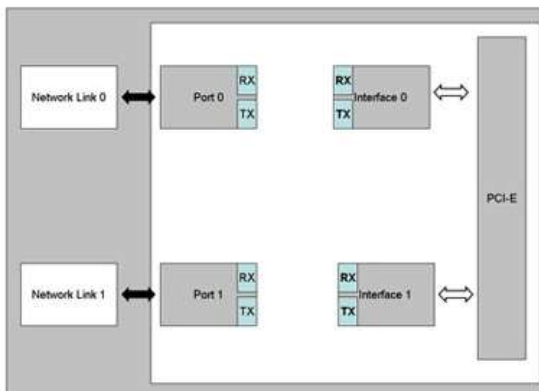
Silicom's Six Port Bypass adapter supports software programmable to select Normal, Bypass or Disconnect modes.

Silicom's Six Port Bypass adapter 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 Six Port Bypass adapter 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
PE2G6BPI35-SD	Six Port Copper Gigabit Ethernet PCI Express Bypass Server Adapter	X8, PCI Express Gen2, Based on Intel i350, standard height, short PCI

-SD: Side Driver

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