



PE210G2DBI9

Dual Port Fiber 10 Gigabit Ethernet PCI Express Content Director Server Adapter Intel® 82599EB Based

Product Description

Silicom's 10 Gigabit Ethernet PCI Express content aware director Bypass server adapters is designed for servers and high-end appliances. The Silicom content aware director server adapter is designed with an on board smart routing architecture that enables packets to be redirected or dropped based on defined rules.



The Silicom's 10 Gigabit Ethernet content aware packet director reduces host system process since only packets that are defined to be targeted to the host systems are routed to the host; other packets can be routed to the other port or can be dropped by the content aware hardware routing architecture.

The Silicom's 10 Gigabit Ethernet content aware packet director is targeted to network applications that needs to process, monitor or bypass packets based on defined rules. The adapter supports three main modes of operation: Content Aware Bypass, Content Aware TAP and content Aware filtering NIC.

Content Aware Bypass

Silicom's 10 Gigabit Ethernet content aware director provides intelligent packet redirection capability where rules specify which packets are directed to the host system and which packets are directed to the other port (Bypass).

Content Aware TAP

Silicom's 10 Gigabit Ethernet content aware director provides intelligent packet redirection capability where all packets are directed to the other port (Bypassed) and rules specify which packets are copied to the host system (TAP).

Content Aware Filtering NIC

Silicom's 10 Gigabit Ethernet content aware provides intelligent packet redirection capability where rules specify which packets are directed to the host or dropped. The Silicom 10 Gigabit Ethernet PCI Express content director server adapter is based on Intel 82599EB Ethernet controller and a L3 switch router.



The Silicom's 10 Gigabit Ethernet PCI Express adapter is based on standard L2 driver and with the content director engine reduces CPU host system processing. The Silicom 10 Gigabit Ethernet PCI Express content aware server adapter offers simple integration into any PCI Express X8 to 10Gigabit Network.

Silicom's 10 Gigabit Ethernet PCI Express content aware supports L1 Bypass. The adapter can Bypass its Ethernet ports on a host system failure, power off, or upon software request. 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.

Hence, in bypass mode all packets received from one port are transmitted to other port and vice versa. This feature enables to bypass a failed system and provides maximum up time for the network.

Key Features

Content Aware Director:

- Provides intelligent packet redirection capability where rules specify which packets are directed to the host system and which packets are directed to the other port (Bypass).
- Provides intelligent packet redirection capability where all packets are directed to the other port (Bypassed) and rules that specify which packets are copied to the host system (TAP).
- Provides intelligent packet filtering / drop capability where rules specify which packets are directed to the host or dropped.
- Provides redirection rules that can be defined using source IP/ destination IP / Source Port / Destination Port / VLAN tuples.
- Redirection and packet filtering / drop are performed by the hardware itself in wire speed and do not require any software and CPU host system power processing.
- Intelligent redirect mechanism is controllable via software.
- Intelligent routing mechanism is controllable via software.

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.
- Emulates standard NIC

Fiber 10Gigabit Ethernet 10GBase-SR:

- Short Range Fiber 10Gigabit Ethernet channels support 10GBase-SR
- LC connectors

Fiber 10Gigabit Ethernet 10GBase-LR:

- Long Range Fiber 10Gigabit Ethernet channels support 10GBase-LR
- LC connectors

Common Key features:

Host Interface:

- PCI Express X8 lane
- Support PCI Express Base Specification Revision 2.0, 5GT/s or 2.5GT/s

Performance Features:

- IPV6 Supports for IP/ TCP and IP/UDP Receive Checksum offload
- Fragmented UDP checksum offload for Packet Reassembly
- Receive Side Scaling minimize CPU utilization across multiple processor systems
- Support for 16 virtual machine Device Queues (VMDq) per port
- Advanced memory architecture reduces latency
- Minimized device I/O interrupts using MSI and MSI-X
- Offload of TCP / IP / UDP checksum calculation and TCP segmentation
- Large on chip receive packet buffer 520 KB / per port
- Large on chip transmit packet buffer 160KB / per port

LAN Features:

- Jumbo Frame (up to 9.5KB)
- LEDs indicator for link/Activity

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}
Short Range Fiber 10Gigabit Ethernet Technical Specifications – (10GBase-SR)	
IEEE Standard / Network topology:	Fiber 10Gigabit Ethernet, 10GBASE-SR (850nm LAN PHY)
Data Transfer Rate:	10.3125GBd

Cables and Operating distance: Up to:	62.5um, 160MHz/Km 13m * 62.5um, (OM1)200MHz/Km 16.5m* 50um, 400MHz/Km 33m * 50um, (OM2)500 MHz/Km 41m * 50um, (OM3)2000MHz/Km 150m* Defined as half as the distance as specified in the optical transceiver
Optical Transmit Power:	Typical: -2.3 dBm Minimum: -3 dBm
Optical Receive Sensitivity:	Typical: -16.8 dBm Maximum: -11.1 dBm
Maximum Input Power:	Maximum: +0.5dBm
Insertion Loss:	Bypass Mode: Insertion loss (Optical Power attenuation between TX to RX) Typical: 1.0 dB (From RX to TX) Maximum 1.9 dB
Long Range Fiber 10Gigabit Ethernet Technical Specifications – (10GBase-LR)	
IEEE Standard / Network topology:	Fiber 10Gigabit Ethernet, 10GBASE-LR (1310nm LAN PHY)
Data Transfer Rate:	10.3125GBd
Cables and Operating distance: Up to:	Single Mode Fiber 9u, Maximum length 5 KM* Defined as half as the distance per the optical transceiver
Optical Transmit Power:	Typical: -4.68 dBm Minimum: -8.2 dBm
Optical Receive Sensitivity:	Typical: -17.29 dBm Maximum: -12.6 dBm
Maximum Input Power:	Maximum: +0.5dBm
Insertion Loss:	Bypass Mode: Insertion loss (Optical Power attenuation between TX to RX) Typical: 1.0dB (From RX to TX) Maximum 1.22 dB

Operating Systems Support	
Operating system support:	Linux
General Technical Specifications	
Interface Standard:	PCI-Express Base Specification Revision 2.0
Board Size:	Standard height short add-in card 167.64mm X 110.16mm (6.60"X 4.34")
PCI Express Card Type:	X8 Lane
PCI Express Voltage:	+3.3V +-9%, +12V +- 8%
PCI Connector:	X8 Lane
Controller:	Intel 82599EB
Holder:	Metal Bracket
Weight:	320g (11.2oz)
Power Consumption:	PE210G2DBI9-SR 21.48 W, 1.79A at 12V and 0.6A at 3.3V: Typical two ports operate at 10G PE210G2DBI9-LR 22.08 W, 1.84A at 12V and 0.63A at 3.3V: Typical two ports operate at 10G
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 40°C (32°F – 104°F)
Storage:	-20°C–65°C (-4°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 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

	<p>CE EN 61000 3-3 1995, Amendment A1: 2001 Voltage Fluctuations and Flicker</p> <p>CE IEC 6100-4-2: 1995 ESD Air Discharge 8kV. Contact Discharge 4kV.</p> <p>CE IEC 6100-4-3:1995 Radiated Immunity (80-1000Mhz), 3V/m 80% A.M. by 1kHz</p> <p>CE IEC 6100-4-4:1995 EFT/B: Immunity to electrical fast transients 1kV Power Leads, 0.5Kv Signals Leads</p> <p>CE IEC 6100-4-5:1995 Immunity to conductive surges COM Mode; 2kV, Dif. Mode 1kV</p> <p>CE IEC 6100-4-6:1996 Conducted immunity (0.15-80 MHz) 3VRMS 80% A.M. By 1kHz</p> <p>CE IEC 6100-4-11:1994 Voltage Dips and Short Interruptions V reduc >95%, 30% >95% Duration 0.5per, 25per, 250per</p>
MTBF*:	<p>MTBF 37 years According to Telcordia SR-332 Issue 2 Environmental condition – GB (Ground, Fixed, Controlled). Ambient temperature 40°C</p>
LEDs	
LEDs:	<p>(2) LEDs per port Link: Turns on link (yellow). ACT: Blinks on activity (green). (1) Bi-Color LED: Bypass: Green on Bypass, Yellow on Disconnect, off on Normal</p>
LEDs location:	LEDs are located on the PCB, visible via holes in the metal bracket holder
Connectors:	(2) LC

Functional Description

Director – Content Aware Bypass

Silicom's 10 Gigabit Ethernet content aware director Provides intelligent packet redirection capability where rules specify which packets are directed to the host system and which packets are directed to the other port (Bypass).

Figure 1: Content Aware Bypass Functional Block Diagram

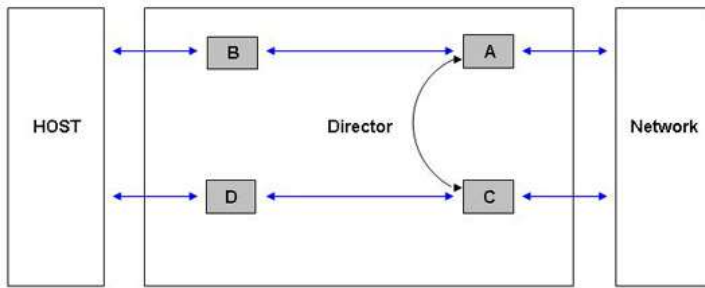


Figure 1 illustrates functional block diagram of content aware Bypass:

Packets received in port A and meet rule are directed to port B, other packets are directed to port C (Bypass).

Packets received in port C and meet rule are directed to port D, other packets are directed to port A (Bypass).

Director – Content Aware TAP

Silicom’s 10 Gigabit Ethernet content aware director Provides intelligent packet redirection capability where all packets are directed to the other port (Bypassed) and rules specify which packets are copied to the host system (TAP).

Figure 2: Content Aware TAP Functional Block Diagram

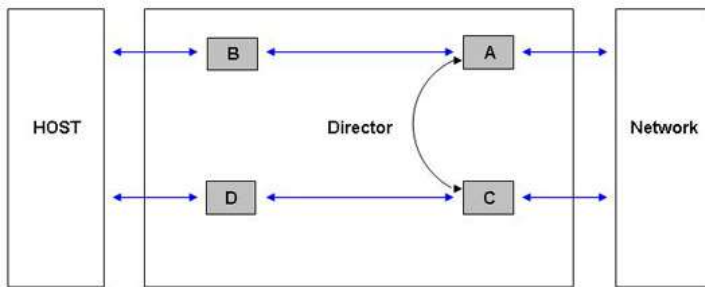


Figure 2 illustrates functional block diagram of content aware TAP:

Packets received in port A and meet rule are directed to ports B and C (TAP), other packets are directed to port C (Bypass).

Packets received in port C and meet rule are directed to ports D and A (TAP), other packets are directed to port A (Bypass).

Director – Content Filtering NIC

Silicom’s 10 Gigabit Ethernet content aware provides intelligent packet redirection capability where rules specify which packets are directed to the host or dropped

Figure 3: Content Aware Filtering NIC Functional Block Diagram

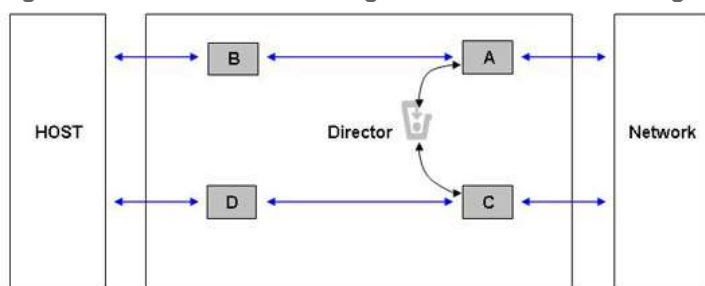


Figure 3 illustrates functional block diagram of content aware TAP:

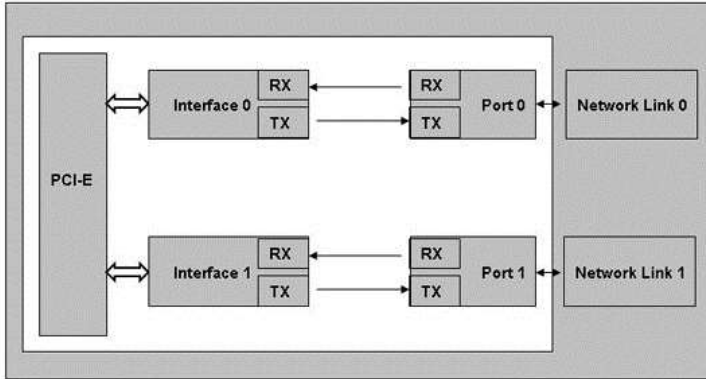
Packets received in port A and meet rule, direct to port B. Packets received in port A and do not meet rule are dropped.

Packets received in port C and meet rule, direct to port D. Packets received in port C and do not meet rule are dropped.

Bypass / Disconnect

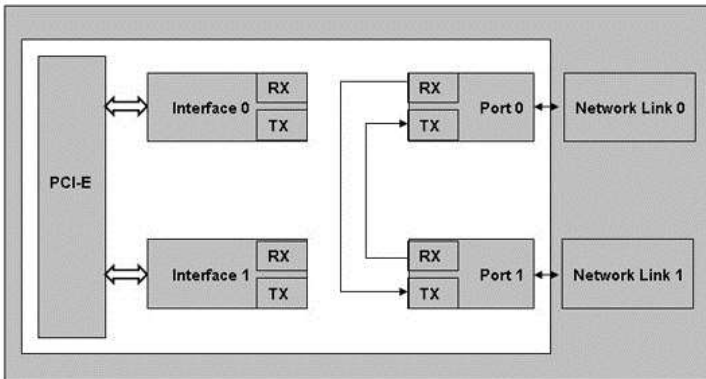
Silicom's Bypass adapter supports Normal, Bypass and Disconnect modes. In Normal mode, the ports are independent interfaces (see Figure 1: Normal mode, one Bypass pair is illustrated).

Figure 4: Normal Mode Functional Block Diagram



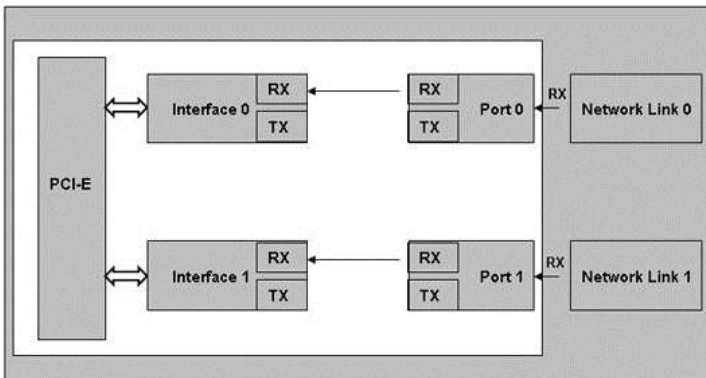
In Bypass mode, the connections of the Ethernet network ports are disconnected from the interfaces and switched over to the other port to create a crossed connection loop-back between the Ethernet ports. The connections of the interfaces are left unconnected. (See Figure 2: one Bypass pair illustrated)

Figure 5: Bypass Mode Functional Block Diagram



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

Figure 6: Disconnect Mode Functional Block Diagram



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

Order Information

P/N	Description	Notes
PE210G2DBI9-SR	Dual port Fiber (SR) 10 Gigabit Ethernet PCI Express Content Director Server Adapter	RoHS Compliant, X8 Gen2, based on Intel 82599EB
PE210G2DBI9-LR	Dual port Fiber (LR) 10 Gigabit Ethernet PCI Express Content Director Server Adapter	RoHS Compliant, X8 Gen 2, based on Intel 82599EB

-SD: Side Driver

1V2