# PE210G4SPi9-LR - Quad Port Fiber (LR) 10 Gigabit Ethernet PCI Express Server Adapter

## Introduction

Silicom's 10 Gigabit Ethernet PCI Express server adapters are designed for Servers and high-end appliances. The Silicom 10 Gigabit Ethernet PCI Express Server adapters offer simple integration into any PCI Express X8 to 10Gigabit Networks. The performance is optimized so that system I/O is not the bottleneck in high-performance networking applications.

The Silicom 10 Gigabit Ethernet PCI Express server adapters are based on Intel 82599ES Ethernet controller with two fully integrated Gigabit Ethernet Media Access Control (MAC) and SFI ports. 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 10 Gigabit Ethernet PCI-Express Server adapters are the ideal solution for implementing multiple network segments, mission-critical high-powered networking applications and environments within high performance servers.

## Key features

### Fiber 10 Gigabit Ethernet 10GBASE-LR:
• 10 Gigabit Fiber Ethernet port supports 10GBASE-LR (1310nM LAN PHY)
• 10Gigabit 1310nM Small form Factor Pluggable (SFP+)

### Host Interface
• PCI Express X8 lanes
• Support PCI Express Base Specification 2.0 (5GT/sec)
• Low power
• LC connector

### Performance Features:
• IPV4 and IPV6 Supports for IP/ TCP and IP/UDP Receive Checksum offload
• Fragmented UDP checksum offload for Packet Reassembly
• CPU utilization- the 82599 supports reduction in CPU utilization, mainly by supporting Receive Side Coalescing (RSC).
• Support for 16 virtual machine Device Queues ( VMDq) per port
• Support Direct Cache Access ( DCA)
• Advanced memory architecture reduces latency by preceding TSO packets. A TSO packet may be interleaved with other packets going to the wire
• 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 (512 KB)
• Large on chip transmit packet buffer ( 160KB)
• Supports the VPD (Vital Product Data) capability defined in the PCI specification ver. 3.0
• Time sync- IEEE1588- Precision Time Protocol (PTP)

• Supports the BCN (Backward Congestion Notification) protocol in addition to the EEDC functionality

**LAN Features:**
• IEEE 802.x flow control support
• IEEE 802.q VLAN tagging support
• Supports a mode where all received and sent packets have at least one VLAN tag in addition to the regular tagging
• IEEE 802.1p layer 2 priority encoding
• Jumbo Frame (up to 16KB)
• Link Aggregation and Load Balancing
• RFC2819 RMON MIB statistics
• TCP Segmentation Offload Up to 256KB
• Ipv6 Support for IP/TCP Receive Checksum Offload
• DDP Offload
• LEDs indicators for link/Activity and speed

**Security Features:**
• IEEE P802.1AE LinkSec specification. It incorporates an inline packet crypto unit to support both privacy and integrity checks on a packet by packet basis. The transmit data path includes both encryption and signing engines. On the receive data path it includes both decryption and integrity checkers.
• IPsec off load for a given number of flows
• Off-load IPsec for up to 1024 Security associations (SA) for each of TX and RX
• AH and ESP protocols for authentication and encryption
• AES-128-GMAC and AES-GCM crypto engines
• Transport mode encapsulation

**Technical Specifications:**

**Fiber 10 Gigabit Ethernet Technical Specifications - (10GBASE-LR) Adapters:**

| 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: 10000m at 9um |
| Output Transmit Power: | Typical: -4.37 dBm<br>Minimum: -8.2 dBm |
| Optical Receive Sensitivity: | Typical: -15.47 dBm<br>Maximum: -14.4 dBm |
| Maximum Input Power: | Maximum: +0.5dBm |

**Operating Systems Support:**

| Operating system support: | Linux<br>Windows |
|---|---|

**PE210G4SPi9-LR: General Technical Specifications**

| | |
|---|---|
| **Interface Standard:** | PCI-Express Base Specification Revision 2.0 (5 GT/s) |
| **Board Size:** | 167.64mm x 74.5mm (6.6"X2.935") |
| **PCI Express Card Type:** | X8 Lane |
| **PCI Express Voltage** | +12V ± 8% |
| **PCI Connector:** | X8 Lane |
| **Controller:** | Intel 82599ES |
| **Holder:** | Metal Bracket |
| **Weight:** | 260 gr (9.17 oz ) |
| **Power Consumption:** | 18.6 W 1.55 A at 12V: Typical all ports operate at 10Gbit/s. 17.76 W 1.48 A at 12V: Typical No link at all ports 14.76 W 1.23 A at 12V: Typical No SFP+ |
| **Operating Humidity:** | 0% – 90%, non-condensing |
| **Operating Temperature:** | 0°C – 50°C (32°F - 122°F) |
| **Storage:** | -20°C – 65°C (-4°F – 149°F) |
| **EMC Certifications:** | FCC Part 15, Subpart B Class B Conducted Emissions Radiated Emissions CE EN 55022: 1998 Class B 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 |

**PE210G4SPi9-LR: LED / Connector Specifications**

| LEDs: | (2) LEDs per port<br>Left LED: Link/Act :<br>  Turns on link (Green),<br>  Blinks on activity (Green)<br>Right LED : Link Speed:<br>  Turns on Blue 10G Link.<br>  Turns on Yellow 1G Link |
|---|---|
| **LEDs location:** | LEDs are located on the PCB, visible via holes in the metal bracket. Each Green Link/Act and LED and Yellow/ Blue Link Speed LED is located above its own SFP connector port by light pipes |
| **Connectors:** | Small Form Factor Pluggable (SFP+) Cage |

**Order Information:**

| P/N | Description | Note |
|---|---|---|
| **PE210G4SPi9-LR** | Quad Port Fiber (LR) 10 Gigabit Ethernet PCI Express Server Adapter | X8, Based on Intel 82599ES, on board support for Fiber SR, RoHS compliant |

Model P/N -LP /
-LP: Assemble Low Profile Metal Bracket

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