



M1E210G6SPi9

Port Fiber SFP+ 10 Gigabit Ethernet ExpressModule Server Adapter

Product Description

Silicom SFP+ 10 Gigabit Ethernet ExpressModule Server adapter is PCI-Express X8 Six SFP 10Gigabit Ethernet network interface card that can fit into a 3.5" HD form factor. The Silicom 10 Gigabit Ethernet ExpressModule Server adapter is the front I/O module in Silicom Server to Network Appliance Converter (SETAC) architecture.

Silicom's SFP+ 10 Gigabit Ethernet ExpressModule server adapters are designed for Servers and high-end appliances. The performance is optimized so that system I/O is not the bottleneck in high-performance networking applications.

The Silicom SFP+ 10 Gigabit Ethernet ExpressModule 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 SFP+ 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

SFP+ 10 Gigabit Ethernet:

- 10Gigabit Ethernet Adapter with SFP cage support

Copper 10SFP+Cu (Passive Direct Attach Cable):

- Compliant with the SFP+ MSA SFF-8431 specification
- Up to 10 meters

Fiber 10 Gigabit Ethernet 10GBASE-SR:

- 10BASE-SR with 10Gigabit 850nm Small form Factor Pluggable (SFP+)

Fiber 10 Gigabit Ethernet 10GBASE-LR:

- 10BASE-LR with 10Gigabit 1310nm Small form Factor Pluggable (SFP+)
- 2PortLink synchronization
- Optional SGMII mode (future support)

Performance Features:

- TCP/UDP Segmentation Offload (256KB in all modes)
- TSO Interleaving for Reduced Latency
- TCP Receive Side Coalescing (RSC) 32 flows / port
- Data Center Bridging (DCB), IEEE Compliance to:
- Priority Groups (up to 8) and Bandwidth Allocation (ETS) IEEE802.1Qaz
- Priority-based Flow Control (PFC) IEEE802.1Qbb
- Transmit Rate Scheduler
- IPv6 Support for IP/TCP and IP/UDP Receive Checksum Offload
- Fragmented UDP Checksum Offload for Packet Reassembly
- FCoE Tx / Rx CRC Offload
- FCoE Tx / Rx CRC Offload (256 KB)
- FCoE Coalescing and Direct Data Placement (512 outstanding Read — Write requests / port)
- Message Signaled Interrupts (MSI)
- Message Signaled Interrupts (MSI-X)
- Interrupt Throttling Control to Limit Maximum Interrupt Rate and Improve CPU Use
- Rx Packet Split Header
- Multiple Rx Queues (RSS)
- Flow Director Filters: up to 32 KB Flows by Hash Filters or up to 8 KB Perfect Match Filters
- Number of Rx Queues (128 per port)
- Number of Tx Queues (128 per port)
- Low Latency Interrupts
- DCA Support
- TCP Timer Interrupts
- Relax Ordering
- Rate Control of Low Latency Interrupts
- 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

Virtualization Features:

- Support up to 64 Virtual Machine Device Queues (VMDq)
- Up to 128 L2 Ethernet MAC Address Filters (unicast and multicast)
- Up to 64 L2 VLAN filters
- PCI-SIG SR IOV
- Multicast and Broadcast Packet Replication
- Packet Mirroring
- Packet Loopback
- Traffic Shaping

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
- IPv4 and IPv6 versions

Common Key features:

- PCI Express ExpressModule Electromechanical Specification Revision 1.0
- Support PCI Express Base Specification 2.0 (2.5 GHz)
- 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 indicator for link/Activity
- Low-Profile Adapter
- Low power
- LC connector

Technical Specifications

SFP+ 10 Gigabit Ethernet Technical Specifications Adapters	
SFP+ (Small Form Factor Pluggable) supports:	SFI interfaces supports 10GBase-R PCS and 10 Gigabit PMA in order to connect with SFP+ to 10GBase-SR / 10GBase-LR and SFP+ Direct Attach
IEEE Standard / Network topology: with 10GBase-SR SFP+	Fiber 10Gigabit Ethernet, 10GBASE-SR (850nm LAN PHY)
IEEE Standard / Network topology: with 10GBase-LR SFP+	Fiber 10Gigabit Ethernet, 10GBASE-LR (1310nm LAN PHY)
IEEE Standard / Network topology: with 10GSFP+Cu	Copper 10Gigabit Ethernet, 10GSFP+Cu (Direct Attach)
Operating Systems Support	
Operating system support:	Windows Linux VMware
General Technical Specifications	
Interface Standard:	PCI Express ExpressModule Electromechanical Spec. Revision 1.0 Silicom SETAC PCI-Express Base Specification Revision 2.0 (5 GT/s)

Board Size:	168.2mm x 98mm (6.62"X3.858")
PCI Express Card Type:	X8 Lane
PCI Express Voltage:	+12V +- 8%
PCI Connector:	Gold Finger: X8
Controller:	Intel 82599ES
Holder:	Not included
I/O:	8 x SFP+ located on edge of the board
Weight:	180 gr (6.35 oz)
Operating Temperature:	-5°C – 45°C (23°F – 133°F)
Storage:	-20°C–65°C (-4°F–149°F)
EMC Certifications:	<p>FCC Part 15, Subpart B Class A</p> <p>Conducted Emissions</p> <p>Radiated Emissions</p> <p>CE EN 55022: 1998 Class A Amendments A1: 2000; A2: 2003</p> <p>Conducted Emissions</p> <p>Radiated Emissions</p> <p>CE EN 55024: 1998 Amendments A1: 2000; A2: 2003</p> <p>Immunity for ITE Amendment A1: 2001</p> <p>CE EN 61000-3-2 2000, Class A</p> <p>Harmonic Current Emissions</p> <p>CE EN 61000 3-3 1995, Amendment A1: 2001</p> <p>Voltage Fluctuations and Flicker</p> <p>CE IEC 6100-4-2: 1995</p> <p>ESD Air Discharge 8kV. Contact Discharge 4kV.</p> <p>CE IEC 6100-4-3:1995</p> <p>Radiated Immunity (80-1000Mhz), 3V/m 80% A.M. by 1kHz</p> <p>CE IEC 6100-4-4:1995</p> <p>EFT/B: Immunity to electrical fast transients 1kV Power Leads, 0.5Kv Signals Leads</p> <p>CE IEC 6100-4-5:1995</p> <p>Immunity to conductive surges COM Mode; 2kV, Dif. Mode 1kV</p> <p>CE IEC 6100-4-6:1996</p> <p>Conducted immunity (0.15-80 MHz) 3VRMS 80% A.M.</p>

	<p>By 1kHz CE IEC 6100-4-11:1994 Voltage Dips and Short Interruptions V reduc >95%, 30% >95% Duration 0.5per, 25per, 250per</p>
LEDs	
LEDs:	<p>(2) LEDs per port Left LED: Link/Act : Turns on link (Green), Blinks on activity (Green) Right LED : Link Speed: Turns on Blue 10G Link. Turns on Yellow 1G Link</p>
LEDs location:	<p>LEDs are located on the PCB, visible via holes in the metal bracket. Each Green Link/Act and LED and Yellow Link Speed LED is located above its own SFP connector port by light pipes</p>
Connectors:	<p>(6) SFP+ cage</p>

Order Information

P/N	Description	Notes
M1E210G6SPI9-XR	Six Port Fiber SFP+ 10 Gigabit Ethernet ExpressModule Server Adapter	x8 Gen2, ExpressModule, Based on Intel 82599ES, Support Direct Attached Copper cable, Support Silicom SFP+ approved transceiver, RoHS Compliant
M1E210G6SPI9-LR	Six Port Fiber (LR) 10 Gigabit Ethernet ExpressModule Server Adapter	x8 Gen2, ExpressModule, Based on Intel 82599ES, on board support for Fiber LR, RoHS Compliant
M1E210G6SPI9-SR	Six Port Fiber (SR) 10 Gigabit Ethernet ExpressModule Server Adapter	x8 Gen2, ExpressModule, Based on Intel 82599ES, on board support for Fiber SR, RoHS Compliant

-C: with canister

Advanced features may require driver software support

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