M1E210G2SPi9

Dual Port Fiber 10 Gigabit Ethernet ExpressModule Server Adapter

Product Description



Silicom's 10 Gigabit Ethernet ExpressModule Bypass server adapters are designed for Servers and high-end appliances.

The 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 ExpressModule server adapters are based on Intel 82599EB 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 ExpressModule 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+ 10Gigabit Ethernet:

10Gigabit Ethernet Adapter with SFP cage support:

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

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

-SR: Fiber 10 Gigabit Ethernet 10GBASE-SR:

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

-LR: Fiber 10 Gigabit Ethernet 10GBASE-LR:

- 10BASE-LR with 10Gigabit 1310nM Small form Factor Pluggable (SFP+)

Fiber 10 Gigabit Ethernet 10GBASE-SR:

- 10 Gigabit Fiber Ethernet port supports 10GBASE-SR (850nM LAN PHY)
- 10Gigabit 850nM Small form Factor Pluggable (SFP+)

Fiber 10 Gigabit Ethernet 10GBASE-LR:

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

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 intterupts 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

Common Key Features:

- PCI Express ExpressModule Electromechanical Specification Revision 1.0
- Support PCI Express Base Specification 2.0 (5 GTs)
- 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 15.5KB)
- 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
- Hot Plug not supported. Can be supported by assembly change.
- Low power

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

SFP+ 10Gigabit 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 / / 1000Base-SX / 10GBase-LR and SFP+ Direct Attach
10GBase-SR SFP+: IEEE Standard / Network topology:	Fiber 10Gigabit Ethernet, 10GBASE-SR (850nM LAN PHY)
10GBase-SR SFP+: Data Transfer Rate :	10.3125GBd
10GBase-SR SFP+: Cables and Operating distance Up to:	62.5um, 160MHz/Km 26m 62.5um, (OM1)200MHz/Km 33m 50um, 400MHz/Km 66m 50um, (OM2)500 MHz/Km 82m 50um, (OM3)2000MHz/Km 300m
10GBase-LR SFP+: IEEE Standard / Network topology:	Fiber 10Gigabit Ethernet, 10GBASE-LR (1310nM LAN PHY)

10GBase-LR SFP+: **Data Transfer Rate:**	10.3125GBd
10GBase-LR SFP+: **Cables and Operating distance Up to:**	Single-Mode: 10000m at 9um
– SR: Fiber 10GBASE-SR Ethernet Technical Specifications:	
Output Transmit Power:	Typical: -2.33 dBm Minimum: -2.8 dBm
Optical Receive Sensitivity:	Typical: -13.45 dBm Maximum: -11.1 dBm
Maximum Input Power:	Maximum: +0.5dBm
– LR: Fiber 10GBASE-LR Ethernet Technical Specifications:	
Output Transmit Power:	Typical: -2.75 dBm Minimum: -8.2 dBm
Optical Receive Sensitivity:	Typical: -14.65 dBm Maximum: -12.6 dBm
Maximum Input Power:	Maximum: +0.5dBm
Operating Systems Support	
Operating system support:	Windows Linux FreeBSD VMware
General Technical Specifications	
Interface Standard:	PCI ExpressModule Specification revision 1.0 PCI-Express Base Specification Revision 2.0 (5 GTs)
Board Size:	168.2mm x 98mm (6.62”X3.858”)
PCI Express Card Type:	X8 Lane
PCI Express Voltage:	+12V ± 15%

PCI Connector:	Gold Finger: X8 Lane
Controller:	Intel 82599ES
Holder:	Not included
I/O:	LC located on internal bracket
Weight:	160gr (5.64 oz)
Power Consumption (SR):	6.72 W, 0.52A at 12V: Typical all ports operate at 10Gb/s4.92W, 0.41A: Typical No link at all ports
Power Consumption (LR):	7.08 W, 0.59A at 12V: Typical all ports operate at 10Gb/s 5.64W, 0.47A: Typical No link at all ports
Operating Temperature:	-5°C – 40°C (23°F – 104°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 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*:	64 (Years) *According to Telcordia SR-332 Issue 1 Environmental condition – GB (Ground, Fixed, Controlled). Ambient temperature – 25°C. Temperature rise of 10°C above the system ambient temperature was assumed for the cards components
LEDs	
LEDs:	(2) LEDs per port Left LED: Link/Act : Turns on link (Green), Blinks on activity (Green) Right LED : Link Speed: Turns on Yellow 1G Link. Turns on Blue 10G Link
LEDs location:	LEDs are located on the PCB, visible via holes in the metal bracket. Each 2 green act/ link and speed link LEDs are located above their own SFP port- visible by light pipes.
Connectors:	(2) LC

Order Information

P/N	Description	Notes
M1E210G2SPI9-XR	M1E210G2SPi9-XR:Dual Port SFP+ 10 Gigabit Ethernet ExpressModule Server Adapter	X8, Based on Intel 82599ES, PCI-E ExpressModule, on board Support Silicom SFP+ approved transceiver, RoHS complian
M1E210G2SPI9-SR	Dual Port Fiber (SR) 10 Gigabit Ethernet ExpressModule Server Adapter	X8, Based on Intel 82599ES, PCI-E ExpressModule, on board support for Fiber SR, RoHS compliant
M1E210G2SPI9-LR	Dual Port Fiber (LR) 10 Gigabit Ethernet ExpressModule Server Adapter	X8, Based on Intel 82599ES, PCI-E ExpressModule, on board support for Fiber LR, RoHS compliant