



M1E310G4i71

Quad Port Fiber SFP+ 10 Gigabit Ethernet Express Module Server Adapter

Product Description

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

The Silicom 10 Gigabit Ethernet Express Module server adapters are based on Intel XL710 Ethernet controller with four 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 Express Module 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

-SRD: Fiber 1/10 Gigabit Ethernet 1000Base-SX / 10GBASE-SR:

- 1000BASE-SX with 1G 850nm Small form Factor Pluggable (SFP+)
- 10GBASE-SR with 10Gigabit 850nm Small form Factor Pluggable (SFP+)

-LRD: Fiber 1/10 Gigabit Ethernet 1000Base-LX / 10GBASE-LR:

- 1000BASE-LX with 1G 1310nm Small form Factor Pluggable (SFP+)
- 10GBASE-LR with 10Gigabit 1310nm Small form Factor Pluggable (SFP+)

-SRD: Fiber 1/10 Gigabit Ethernet 1000Base-SX / 10GBASE-SR:

- 10 Gigabit Fiber Ethernet port supports 10GBASE-SR (850nm LAN PHY)
- 1Gigabit Fiber Ethernet port supports 1000BASE-SX (850nm LAN PHY)
- 1/10Gigabit 850nm Small form Factor Pluggable (SFP+)

-LRD: Fiber 1/10 Gigabit Ethernet 1000Base-LX / 10GBASE-LR:

- 10 Gigabit Fiber Ethernet port supports 10GBASE-LR (1310nm LAN PHY)
- 1Gigabit Fiber Ethernet port supports 1000BASE-LX (1310nm LAN PHY)
- 1/10Gigabit 1310nm Small form Factor Pluggable (SFP+)

Host Interface:

- PCI Express X8 lanes
- Support PCI Express Base Specification 3.0 (8GT/sec)
- Low power
- SFP+ cage

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 X710 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

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
10GSFP+Cu : IEEE Standard / Network topology:	Copper 10Gigabit Ethernet, 10GSFP+Cu (Direct Attach)
1000Base-SX / 10GBase-SR SFP+: IEEE Standard / Network topology:	Fiber Gigabit Ethernet, 1000Base-SX (850nm LAN PHY) Fiber 10Gigabit Ethernet, 10GBASE-SR (850nm LAN PHY)
1000Base-SX / 10GBase-SR SFP+: Data Transfer Rate :	10.3125GBd / 1.25GBd
10000Base-SX / 10GBase-SR SFP+: Cables and Operating distance Up to:	10000Base-SX: 62.5um, 160MHz/Km 220m 62.5um, (OM1)200MHz/Km 275m 50um, 400MHz/Km 500m 50um, (OM2)500 MHz/Km 550m 50um, (OM3)2000MHz/Km >550m 10GBase-SR: 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
1000Base-LX / 10GBase-LR SFP+: IEEE Standard / Network topology:	Fiber Gigabit Ethernet, 1000Base-LX (1310nm LAN PHY) Fiber 10Gigabit Ethernet, 10GBASE-LR (1310nm LAN PHY)
1000Base-LX / 10GBase-LR SFP+: Data Transfer Rate :	10.3125GBd / 1.25GBd
1000Base-LX / 10GBase-LR SFP+: Cables and Operating distance Up to:	10000Base-LX: Single-Mode: 5000m at 9um 10GBase-LR: Single-Mode: 10000m at 9um

– SRD: Fiber 1000BASE-SX / 10GBASE-SR Technical Specifications:

Optical Output Power (1G):	Typical: TBD dBm Minimum: -9.5 dBm
Optical Receive Sensitivity (1G):	Typical: TBD dBm Maximum: -17 dBm
Maximum Input Power (1G):	Maximum: +0.5dBm
Output Transmit Power (10G):	Typical: TBD dBm Minimum: -5 dBm
Optical Receive Sensitivity (10G):	Typical: TBD dBm Maximum: -11.1 dBm
Maximum Input Power (10G):	Maximum: +0.5dBm

– LRD: Fiber 1000BASE-LX / 10GBASE-LR Technical Specifications:

Optical Output Power (1G):	Typical: TBD dBm Minimum: -11 dBm
Optical Receive Sensitivity (1G):	Typical: TBD dBm Maximum: -19 dBm
Maximum Input Power (1G):	Maximum: +0.5dBm
Output Transmit Power (10G):	Typical: TBD dBm Minimum: -8.2 dBm
Optical Receive Sensitivity (10G):	Typical: TBD dBm Maximum: -12.5 dBm
Maximum Input Power (10G):	Maximum: +0.5dBm

Operating Systems Support

Operating system support:	Windows Linux FreeBSD VMware
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General Technical Specifications

Interface Standard:	PCI ExpressModule Specification revision 1.0 Silicom SETAC PCI-Express Base Specification Revision 3.0 (8 GTs)
Board Size:	168.2mm x 98mm (6.62"X3.858")
PCI Express Card Type:	X8 Lane
PCI Express Voltage:	+12V ± 15%
PCI Connector:	X8 Lane
Controller:	Intel FTXL710AM1
Holder:	Not included
I/O:	Quad SFP+ Cage located on edge of the board
Weight:	TBD gr (TBD oz)
Power Consumption (M1E310G4i71-XR):	TBD W TBD A at 12V: Typical No SFP+
Power Consumption (M1E310G4i71-SRD):	TBD W TBD A at 12V: Typical, 10GBASE-SR transceivers are installed in all ports; all ports operate at 10Gb/s. TBD W TBD A at 12V: Typical, 1GBASE-SX transceivers are installed in all ports; all ports operate at 1Gb/s. TBD W TBD A at 12V: Typical, No link at all ports
Power Consumption (M1E310G4i71-LRD):	TBD W TBD A at 12V: Typical, 10GBASE-LR transceivers are installed in all ports; all ports operate at 10Gb/s. TBD W TBD A at 12V: Typical, 1GBASE-LX transceivers are installed in all ports; all ports operate at 1Gb/s. TBD W TBD A at 12V: Typical, No link at all ports
Power Consumption (M1E310G4i71-DA):	TBD W TBD A at 12V: Typical, SFP+ direct attach Copper Cables are installed in all ports; all ports operate at 10Gb/s. TBD W TBD A at 12V: Typical, No link at all ports
Operating Humidity:	0%–90%, non-condensing

Operating Temperature:	-5°C – 40°C (23°F – 104°F)
Storage:	-40°C–65°C (-40°F–149°F)
EMC Certifications:	<p>FCC 47CFR Part 15:2013, Subpart B Class B</p> <p>Conducted emissions</p> <p>Radiated emissions</p> <p>EN 55022: 2010, Class B</p> <p>Conducted disturbance at mains terminals</p> <p>Conducted disturbance at telecommunication port</p> <p>Radiated disturbance</p> <p>EN 61000-3-2: 2006+A1(09)+A2(09)</p> <p>Harmonic current emissions</p> <p>EN 61000-3-3: 2008</p> <p>Voltage fluctuations and flicker</p> <p>EN 55024: 2010</p> <p>Immunity to electrostatic discharge (ESD)</p> <p>Radiated immunity to radio frequency electromagnetic field</p> <p>Conducted immunity to electrical fast transients / bursts (EFT/ B)</p> <p>Conducted immunity to voltage surges</p> <p>Conducted immunity to disturbances induced by radio frequency field</p> <p>Conducted immunity to voltage dips and short interruptions</p>
MTBF*:	<p>36 years</p> <p>* According to Telcordia SR-332 Issue 2. Environmental condition – GB (Ground, Fixed, and Controlled). Ambient temperature 40°C</p>
LEDs	
LEDs:	<p>(2) LEDs per port</p> <p>Left LED : Link Speed: Turns on Blue 10G Link. Turns Off – 1G Link</p> <p>Right LED: Link/Act : Turns on link (Green), Blinks on activity (Green)</p>
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:	Quad SFP+ cage

Order Information

P/N	Description	Notes
M1E310G4I71-XR	Quad Port SFP+ 10 Gigabit Ethernet Express Module Server Adapter	X8 Gen2 , Based on Intel XL710, Support Direct Attached Copper cable, Support Silicom SFP+ approved transceiver. RoHS compliant
M1E310G4I71-SRD	Quad Port Fiber (SX/ SR) 1/ 10 Gigabit Ethernet Express Module Server Adapter	X8, Based on Intel XL710 , PCI-E adapter, on board support for Fiber SX/ SR, RoHS compliant
M1E310G4I71-LRD	Quad Port Fiber (LX/LSR) 1/ 10 Gigabit Ethernet Express Module Server Adapter	X8, Based on Intel XL710, PCI-E adapter, on board support for Fiber LX/ LR, RoHS compliant

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