



### **M1E2G8i80SC62**

#### **Eight Port Copper Gigabit Ethernet and Security accelerator Multifunction ExpressModule Server Adapter**

##### **Product Description**

Silicom's Eight Port Copper Gigabit Ethernet and security protocol accelerator multifunction ExpressModule Server adapter is PCI-Express X8 Eight Copper Gigabit Ethernet network interface card and security protocol accelerator that can fit into a 3.5" HD form factor. The Silicom Eight Port Copper Express Module is the front I/O module in Silicom Server to Network Appliance Converter (SETAC) architecture.

Silicom's Eight Port Copper Gigabit Ethernet and security ExpressModule Server adapter is 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.

Silicom's Eight Port Copper Gigabit Ethernet and security protocol accelerator multifunction ExpressModule Server adapters are based on Intel 82580EB Ethernet controller with quad fully integrated Gigabit Ethernet Media Access Control (MAC) and PHY and on the Cavium Nitrox PX (16XX) Security protocol processor accelerator.

Silicom's multifunction security protocol adapter provides bulk cryptographic acceleration for 3DES, DES, AES and ARCFOUR symmetric encryption algorithms, for the SHA-1 and MD5 hash algorithm, and for the HMAC-SHA-1 and HMAC-MD5 keyed authentication algorithms. It provides public key acceleration for the RSA, DSA, and diffie-Helman asymmetric algorithms, as well as basic Modular Math functions.

Macro processing within the CN1620 processor, allows systems to offload high-level SSL or IPsec protocol commands that reduce the host I/O traffic and system processor to increase the total system throughput. This also frees system processor resources for other functions, increasing overall system performance.

The Silicom Protocol Processor ExpressModule adapter is the ideal solution for high-end and mid-end virtual private networking (VPN), firewall appliances and SSL-based appliances.

Silicom's Eight Port Copper Gigabit Ethernet and security 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**

###### **Copper Gigabit Ethernet 1000Base-T:**

- Independently copper Gigabit Ethernet channels support four Gigabit Ethernet (1000Base-T), Fast Ethernet (100Base-Tx) and Ethernet (10Base-T)

- Triple speed 1000Mbps (1000Base-T), 100 Mbps (100Base-Tx) and 10 Mbps (100Base-T) operation
- Nway auto negotiation automatic sensing and switching between 1Gbps full duplex and 100 / 10 Mbps operations Simplex or Full Duplex
- RJ-45 female connectors

#### **Performance Features:**

- Supports Intel I/O @ Acceleration Technology v3.0
- Stateless offloads (header split, RSS)
- Direct Cache access
- UDP, TCP, and IP Checksum offload
- UDP and TCP transmit checksum offload
- SCTP receive and transmit checksum offload

#### **Virtualization Ready:**

- 8 Transmit and Receive queues per port
- Support up to 8 VMs per port ( 1 queue allocated to each VM)
- Packet interrupt coalescing timers (packet timers) and absolute- delay interrupt timers for both transmit and receive operation

#### **Security:**

- Single Chip solutions that accelerates all cryptographic operations and the SSL, IPsec / IKE, and CCMP protocols
- Up to 32K 180-bit Diffie-Hellman Public Key generation (groups 1,2,5)
- Up to 17K 1024-bit RSA operations/second
- Up to 2.5Gbps Bulk Data Encryption + Hashing (SSL, IPsec, or CCMP)
- Multi Algorithm support
- RSA and Diffie-Helman (Groups 1,2,5)
- DES/3DES, AES, ARCFOUR
- MD5, SHA-1, HMAC-MD5, HMAC-SHA-1
- AES-GCM
- KASUMI
- SHA-256/384/512
- 200Mbps Random Number Generator
- Host Interface: PCI Express x4 lanes

#### **Applications:**

- VPN appliances

- VPN firewalls, routers and switches
- Secure WEB Servers and storage
- Secure Access devices

**Common Key features:**

- PCI Express ExpressModule Electromechanical Specification Revision 1.0
- PCI Express Base Specification 2.0 (5 GTs)
- High performance, reliability, and low power use in Intel 82580 Quad integrated MAC + PHY and SERDES chip Controllers
- Hardware acceleration that can offload tasks from the host processor. The Controllers can offload TCP/UDP/IP checksum calculations and TCP segmentation
- Server class reliability, availability and performance features:
  - Link Aggregation and Load Balancing
  - Switch dependent: 802.3ad (LACP), Generic Trunking ( GEC / FEC)
  - Switch and NIC Independent
  - Failover
- Priority queuing – 802.1p layer 2 priority encoding
- Virtual LANs –802.1q VLAN tagging
- Jumbo Frame (9.5KB)
- 802.x flow control
- Multicast/ broadcast Packet replication on receive
- Statistics for SNMP MIB II, Ethernet like MIB, and Ethernet MIB (802.3z, Clause 30)
- Supports Vital Product Data (VPD)
- Supports End to End CRC (ECRC)
- Supports Latency Tolerance Reporting (LTR)
- LEDs indicators for link/Activity status
- Hot Plug not supported. Can be supported by assembly change

**Technical Specifications**

<b>Copper Gigabit Ethernet Technical Specifications – (1000Base-T) Adapters</b>	
<b>IEEE Standard / Network topology</b>	Gigabit Ethernet, 1000Base-T Fast Ethernet, 100Base-TX Ethernet, 10Base-T
<b>Full duplex / Simplex</b>	Support both Simplex & Full duplex operation in all operating speeds

<b>Auto negotiation</b>	Auto-negotiation between Full duplex and simplex operations and between 10Mb/s 100Mb/s speeds and duplex 1000Mb/s
<b>Data Transfer Rate</b>	1000 Mbit/s, 100 Mbit/s and 10 Mbits/sec in simplex mode per port 2000Mbit/s 200 and 20 Mbit/s in full duplex mode per port
<b>Cables and Operating distance</b>	10Base-T Category 3, 4, or 5 maximum 100m 100Base-Tx Category 5 maximum 100m 1000Base-T Category 5E maximum 100m
<b>Security System Throughout</b>	
System Throughout values are shown below. System values represent measured, memory-to-memory, in-system throughput on an optional platform using large buffer sizes and maximum pipelining.	
<b>Function</b>	<b>Value</b>
<b>Full SSL processing throughout AES+SHA</b>	2500 Mbp/s
<b>Full IPsec AES/SHA</b>	2500 Mbp/s
<b>MAX Diffie-Helman (1024-bit module, 180-bit exponent)</b>	32000 Transaction /Second
<b>MAX RSA 1024-bit exponent with CRT</b>	17000 Transaction /Second
<b>Random Number Generator</b>	200 Mbps
<b>Operating Systems Support</b>	
<b>Operating system support:</b>	Linux
<b>General Technical Specifications</b>	
<b>Interface Standard:</b>	PCI ExpressModule Specification revision 1.0 Silicom SETAC PCI-Express Base Specification Revision 2.0 ( 5 GTs)
<b>Board Size:</b>	168.2mm x 98mm (6.62"X3.858")
<b>PCI Express Card Type:</b>	X8

<b>PCI Express Voltage:</b>	+12V +- 8%
<b>PCI Connector:</b>	Gold Finger: X8
<b>Controller:</b>	Intel 82580EB , Cavium Nitrox PX 1620
<b>Holder:</b>	Not included
<b>I/O:</b>	8 x RJ45 (4X2) located on edge of the board
<b>Weight:</b>	240 gram (8.46 oz)
<b>Power Consumption:</b>	<p>15.6 W, 1.3A at 12V: Typical all ports operate at 1000Mbit/s, with security*.  14.4 W, 1.2 A at 12V: Typical all ports operate at 100Mbit/s, with security*.  13.44 W, 1.12 A at 12V: Typical all ports operate at 10Mbit/s, with security*.  15.48 W, 1.29 A at 12V: Typical all ports operate at 1000Mbit/s, without security.  13.2 W, 1.1 A at 12V: Typical all ports operate at 100Mbit/s, without security.  13.08 W, 1.09 A at 12V: Typical all ports operate at 10Mbit/s, without security.  11.52 W, 0.96 A at 12V: Typical No link at all ports</p> <p>* Typical values when CN1620 works in mode of 4 cores</p>
<b>Operating Temperature:</b>	<p>-5°C – 35°C (23°F – 95°F) for zero air flow  -5°C – 40°C (23°F – 104°F) for 0.6 CFM air flow</p>
<b>Storage:</b>	-20°C–65°C (-4°F–149°F)
<b>EMC Certifications:</b>	<p>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</p>

	<p>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. By 1kHz</p> <p>CE IEC 6100-4-11:1994</p> <p>Voltage Dips and Short Interruptions</p> <p>V reduc &gt;95%, 30% &gt;95% Duration 0.5per, 25per, 250per</p>
<b>LEDs</b>	
<b>LEDs:</b>	<p>(2) LEDs per port</p> <p>Left LED: Link/Act :</p> <p>Turns on link (Green),</p> <p>Blinks on activity (Green)</p> <p>Right LED : Link Speed:</p> <p>Turns on Yellow 1G Link.</p> <p>Turns on Green 100M Link</p>
<b>LEDs location:</b>	LEDs are integrated with the RJ-45 connector. Each port has 2 Leds: one in each side: left: link-act, right: speed
<b>Connectors:</b>	(1) Shielded Octal RJ-45 4X2

## Order Information

P/N	Description	Notes
<b>M1E2G8I80SC62-R</b>	Eight Port Copper Gigabit Ethernet and Security Accelerator multifunction Express Module Server Adapter	X8, Based on Intel 82580EB, Cavium Nitrox PX 1620, PCI-E ExpressModule, RoHS compliant, Security

-R: RoHS Compliant / Lead free adapter

-C: with canister

Advanced features may require driver software support

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