



PE310G4DE488BS3

Quad Port 10GbE Broadwell DE In-Line System on NIC Network Adapter

Product Description

Silicom's Broadwell DE System On a NIC (SoNIC) is based on Intel BDW-DE System on a Chip (SoC) Xeon D-1500 Processor. The Silicom's BDW-DE SoNIC is targeted for network applications offload, such as multiservice Intrusion detection and prevention (IDS / IPS), unified threat management (UTM), Deep packet inspection, VPN/Firewall/IDS systems, and any other offload packet processing PCI Express adapter.



Key Features

- Based on Intel® Xeon® SoC Processor D-1500 Product family
- 14nm Intel Haswell Microarchitecture
- SoC One chip Solution, Integrated PCH technology, Intel Ethernet, BGA package
- HW and SW scalability, x86 architecture, 2C – 16C, Up to 45W TDP
- SoNIC mains SKUs
 - In-line, Ethernet 2x10G connection to the host server
 - NTB, Non Transparent Bridge PCIe x8G3 connection to the host
- Two channels of 64bit DDR4 memory with ECC, 8GByte, 1600-2400MT/s
- Quad SFP+ 10GbE IO port
- 1GbE Ethernet management port
- Intel QuickAssist® Accelerator (Coleto Creek 89XX)
- M.2 SSD SATA Card slot, 3 SATA Ports, SPI Flash, 128Mb
- On Board Micro-BMC Controller
- BIOS: Coreboot, Intel Firmware Support Package (FSP)
- OS: Fedora release 22, Kernel 4.1.3 on M2.SSD
- Form Factor, PCIe Standard height Long (12.28" x 4.2", 312mm x 106.7mm), x8G3, up to 2 slots, (with heatsnik)
- Passive and Active heat sink options



Adapter Features:

- Programmable (x86) Intelligent Quad Port 10GBE PCI Express x8 Gen3.0 NIC
- Front End Packet Processing Offload
- Based BDW-DE SOC, 2- 16 Core Intel@ Xeon (14nm) CPUs
- Xeon Class Server Features
- X86, C-programmable, flexible
- SMBUS/NC-SI support
- Ability to SW reboot the device. SW power down/up the system
- On board based management, control fans, monitor temperature
- Remotely manageable
- The best industry performance per watt

Target Applications:

- Network application accelerator offload
- Data Center Accelerator offload
- Security / Compression Accelerator offload
- Storage Accelerator offload

Technical Specifications

Hardware

Processors

Intel Xeon Processors (embedded in Broadwell-DE SoC)

- 2 to 16 core devices supported
- 45W (and lower) SKUs supported
- 32KB Instruction and data caches, 256KB mid-level cache, and 1.5GB last level cache units per CPU core
- 46 bit virtual and physical address spaces per core
- Intel Hyper-Threading Technology supported (2 threads per core)

Processor Memory

- 2 Channels of 64 bit DDR4 memory with ECC
- 1600 to 2400 MT/s memory speeds supported
- Single rank per channel
- Nine 8 bit devices soldered directly to PCB (i.e. memory down) per channel

Network Interfaces

Quad SFP+ 10Gb Ethernet module slots

- Accessible on the front faceplate
- SFP+ MSA SFF-8431 compliant
- Power Level II modules (1.5W max) supported
- Link/activity LED per module slot

Dual 10Gb Ethernet virtual ports (In-line version only)

- 10GBASE-KR interface between controller and Broadwell-DE SoC

1Gb Ethernet Management port

- RJ45 (with integrated LEDs) accessible on front faceplate

Security

Optional Intel QuickAssist Accelerator (Coletto Creek PCH)

- Symmetric Cryptographic Functions: Cipher, Hash, Authenticate, Key Derivation, and Random Number Generation
- Public Key Functions: RSA, Diffie-Helman, Digital Signature, Elliptic Curve Cryptography: ECDSA* and ECDH*, Random Number Generation and Prime Number Testing
- Compression/Decompression: Deflate (Lempel-Ziv 77-Stac)

Storage Interfaces and Devices

M.2 SSD SATA Card slot

- SATA revision 3 6Gb/s rates supported
- Type 2242 –D2-M-x form factor supported SATA Ports
- SATA revision 3 6Gb/s rates supported

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- Two 7 pin right angle data connectors locate along top edge of PCB, one 7 pin right angle data connector located along rear edge of the PCB

SPI Flash, 128Mb

- For storing BIOS/BSP code
- 2x4 pin header and isolation circuitry provided for programming Flash device

Board Management

Two options for on board management: Micro-BMC or a Remote Thermal Monitor/Fan Controller IC

- Board management scheme selected through a jumper on board
- Control and monitoring of two on board fans

- Board thermal monitoring including access to Broadwell-DE SoC internal temperature data
- Voltage monitoring of various rails
- Ability to remotely reboot or power down the board
- Access to boards FRU EEPROM
- Slave SMBus interface for access from the PCIe card interface
- Monitoring of Broadwell-DE SoC power state and thermal status

Micro-BMC

- Low cost design based on the NXP LPC1768 microcontroller
- Access provided through a NC-SI interface to the 1Gb Ethernet controller
- Serial BMC and Intel console ports for debug
- Slave SMBus interface for access from the PCIe card interface

Remote Thermal Monitor and Fan Controller (On Semi NCT7491 or equivalent)

- PECI 3.0 Interface compatible
- On-chip Temperature Sensor

Peripheral Interfaces

3 USB 3.0 ports

- One accessible through the front faceplate
- Two located along rearedge of PCB
- Type-A right angle connectors (faceplate one stands on edge)

Debug Interfaces

2 Extended Debug Ports (XDP)

- One for the CPU cores side of the Broadwell-DE SoC
- One for the PCH side of the Broadwell-DE SoC
- Samtec 60 pin BSH-030-01 series connector for each (not populated in production)

2 virtual serial ports via a USB2.0 Interface

- One serial port for Micro-BMC console and programming
- One serial port for an Intel console interface sourced from the Broadwell-DE SoC (this console port can also be connected to the Micro-BMC to be accessed across the Ethernet management port as selected through a jumper)
- Micro-B USB right angle connector located along the top board edge

Power	12VDC through a 6 pin connector (Molex 45558-0003 or equivalent) located on rear edge of board
Form Factor	PCI Express Add-in Card, standard height, full length
Dimensions	12.28" x 4.2", 312mm x 106.7mm
PCIe	PCI Express x8 Gen 3.0
Operating Temps	
0C to +50C	
<ul style="list-style-type: none"> Passive heatsink used on some SKUs requiring 300LFM across the heatsink in the direction of the fins. These SKUs will require two PCIe slots Design will support up to two fans for thermal management of the SoNIC 	
Storage Temps	-20C to +65C
Operating Humidity	0% to 90%, non-condensing

EMC Certification Requirements

- FCC Part 15-B Class A, Conducted and Radiated Emissions
- CE EN 55022: 1998 Class A, Amendments A1: 2000; A2: 2003, Conducted and 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 61000-4-2: 1995 (ESD Discharge, Air 8kV, Contact 4kV)
- CE IEC 61000-4-3: 1995 (Radiated Immunity, 80-1000MHz, 3V/m)
- CE IEC 61000-4-4: 1995 (Immunity to fast electrical transients)
- CE IEC 61000-4-5: 1995 (Immunity to conductive surges)
- CE IEC 61000-4-6: 1996 (Conductive Immunity, 0.15-80MHz, 3Vrms)
- CE IEC 61000-4-11: 1994 (Voltage Dips and short Interruptions)

SFP+ LEDs	LED per port Link /ACT : Turns on link , blinks on activity (green)
SFP+ LEDs location	LED is located on the PCB, visible via holes in the metal bracket holder
Operating Systems Support	
Operating system support:	Linux Fedora release 22 Kernel 4.1.3 on M2.SSD
BIOS	Coreboot, Intel Firmware Support Package (FSP)

Coletto SKUs

Coletto Creek chip	Sku2	Sku3
Intel® Quick Assist Technology Capability	50Gbps	50Gbps
IPSec	43Gbps	43Gbps
SSL	50Gbps	50Gbps
Compression	20G	23G
Kasumi/ Snow3G	30Gbps	30Gbps
RSA Decrypt 1k-bit	165K (ops/sec)	190K (ops/sec)
RSA Decrypt 2k-bit	35K (ops/sec)	40K (ops/sec)

Order Information

P/N	Description	Notes
PE310G4DE488BS3I	Quad 10GbE BDW-DE In-Line System on a NIC	PCIe: X8 G3 Netowrk IO: 4x10G DE48: Broadwell DE D-1548, 8 Cores, TDP 45W, Core Freq 2.0GHz. 8B: 8Giga Byte, DDR4, Speed grade B 2133 MT/S S3: Secuirity Coleo Creel SKUs 3: 8955 I: In-line
PE310G4DE488BS3N	Quad 10GbE BDW-DE NTB System on a NIC	PCIe: X8 G3 Netowrk IO: 4x10G DE48: Broadwell DE D-1548, 8 Cores, TDP 45W, Core Freq 2.0GHz. 8B: 8Giga Byte, DDR4, Speed grade B 2133 MT/S S3: Secuirity Coleo Creel SKUs 3: 8955 N: NTB

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