

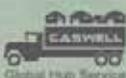


# Complete Your Solution

- ✔ **Wireless Gateway**
- ✔ **Network Management**  
( RAS, QoS, Load Balancing)
- ✔ **Network Security**  
( UTM, Firewall/VPN, IDS/IPS,  
Anti-Spam, Content Filtering)
- ✔ **VoIP, MMBS and ATCA**



100%  
test



**CASWELL**  
Complete Your Solution

Caswell technology and services make our life boundless

Taking the Lead And Growing with Joy!

Continuous learning is our key to lead in high-tech industry

Every last detail is attentively cared.

All voices are attentively heard and good communication is established between

Infinite hope makes all employees' dream tangible

Happiness comes from hard work and self-affirmation

# CASwell Inc.

## Portwell Engine (PE) Building



### CASwell at a glance

Established in 2007, CASwell, Inc. is one of the world's leading manufacturers in communication appliances and a spin-off from the Portwell Group - a world leading Industrial PC (IPC) manufacturer. We have been registered in the Taiwan Stock Exchange Market since 2001 and have achieved breakthrough milestones since 1999.

As the founder and leader of the "communication appliance" segment, we have built our reputation by offering advanced technology, product-scalable coverage, global logistics service, and comprehensive manufacturing efficiency. Since our inception, we have consistently offered the communication appliance segment's leading technologies and dedicated design services for Tier-1 partners worldwide.

CASwell is committed to customer satisfaction. We listen, think, and quickly respond to the needs of

our customers. We apply creative ideas, the latest technologies, and solid engineering experience for problem solving. We have consistently experienced strong growth by building solid partnerships with our customers. Industrial-grade suppliers from around the world trust us with their manufacturing needs due to our unique integration of cutting-edge process technologies, pioneering design services, manufacturing productivity, and product quality.

To better manage our long-term strategic growth, CASwell is investing in VOIP, ATCA and Cloud Computing related-technology. With various technology offerings and unique value propositions, we continue to aggressively pursue new opportunities in these fields.

## A Great Place to Work

Our employees are our most important assets. Sharing wealth is an integral part of our philosophy of compensation and benefits. We offer a competitive package to attract, retain, develop, motivate, and reward hard-working employees. CASwell strives to create a workplace environment that encourages employees to excel. We have a customer-focused, results-driven, innovation-oriented, people-focused culture where the talents and commitment of our employees are recognized and rewarded.

CASwell offers individuals a variety of career development paths that enable them to quickly contribute to our company goals. And we also provide new employees with the opportunity to learn from some of the best managers and engineers in our industries. CASwell is an equal opportunity employer and we are committed to providing a workplace free of any discrimination or harassment.



## Creativity

CASwell provides a variety of competitive compensation programs to motivate employees by aligning their personal development and contributions with the company's long-term business achievements. We are committed to pay-for-performance incentive programs that reward our employees based upon the value they add to the company. Award criteria are based on a combination of corporate, team, and individual performances.

CASwell has also built a leisurely and friendly environment equipped with a gym, entertainment room, jazz-style restaurant, sky garden, and creation center, allowing our employees to work in a great atmosphere conducive to inspiration, innovation, and creation of new technology. In every Portwell Group activity, CASwell is very pleased to be a part of and enjoy the team related activities.



## Why CASwell

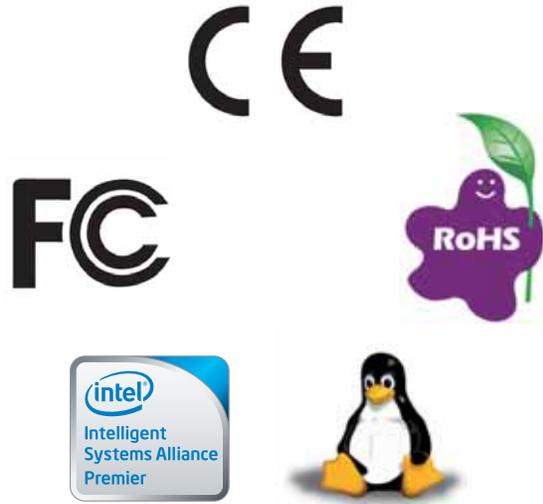
When considering why CASwell is a better choice than other companies to work for, there are many benefits that cannot go unnoticed. CASwell is where you see people in action, developing and sustaining innovation technology leadership, manufacturing excellence, global logistics services, and customer collaboration. At the same time, CASwell is where you find people who enjoy a great place to work. Working with CASwell's people is beyond expectation, depending on how much you are willing to explore. You will also find our competitive rewards, which demonstrate the brilliance in CASwell, to constantly pursue excellence. We offer :

- 10-years experience in systems technologies
- APs and drivers ready on cross-platform operating system
- Automatic and speedy enclosure with in-house
- Validated design with quality in our comprehensive labs
- Customization with global hub services
- Project management in timely manner
- Abundant resources from the Portwell Group (PE)



# Portwell Group (PE) provides the following labs, in-house:

- Environmental Chamber Test Lab
- Acoustic Noise Test Lab
- Drop/Vibration/Shock Test Lab
- ESD Test Lab
- EMS Test Lab
- EMI/EMC Test Lab
- Signal Simulation Test Lab
- IP65 Compliance Rain/Dust Test Lab
- Halt/Hass Abnormal Test Lab
- Power Test Lab
- ATCA Test Lab



Portwell Worldwide map



# Software Ability

- Provide secure LOM firmware for IPMI capability; security requirements are considered in design.
- Provide a variety of component firmwares for CASwell products.
- Provide a variety of utilities to operate the components of CASwell products, e.g. monitor PSU states, scan NIP cards, etc.
- Provide customization service of software.

## R & D force

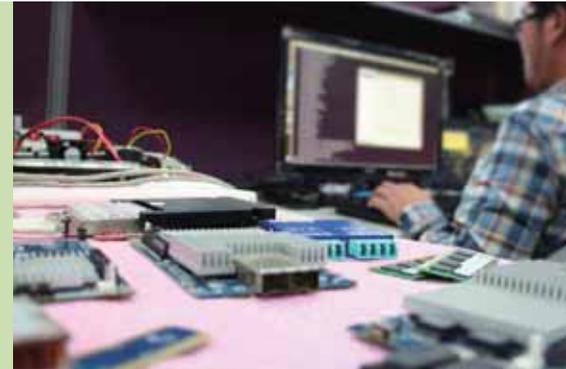
- Independent team to research advanced technology to create new values for customers.

## R & D Environments

- Complete version controlling management for all software deliverables.
- Issue tracking system in life cycle of software development.
- Unify development & build environments.

## Software Services

- Provide a variety of drivers for CASwell products and relative sample utilities to test the capability of drivers. (These drivers are tested with several versions of the Linux kernels.)

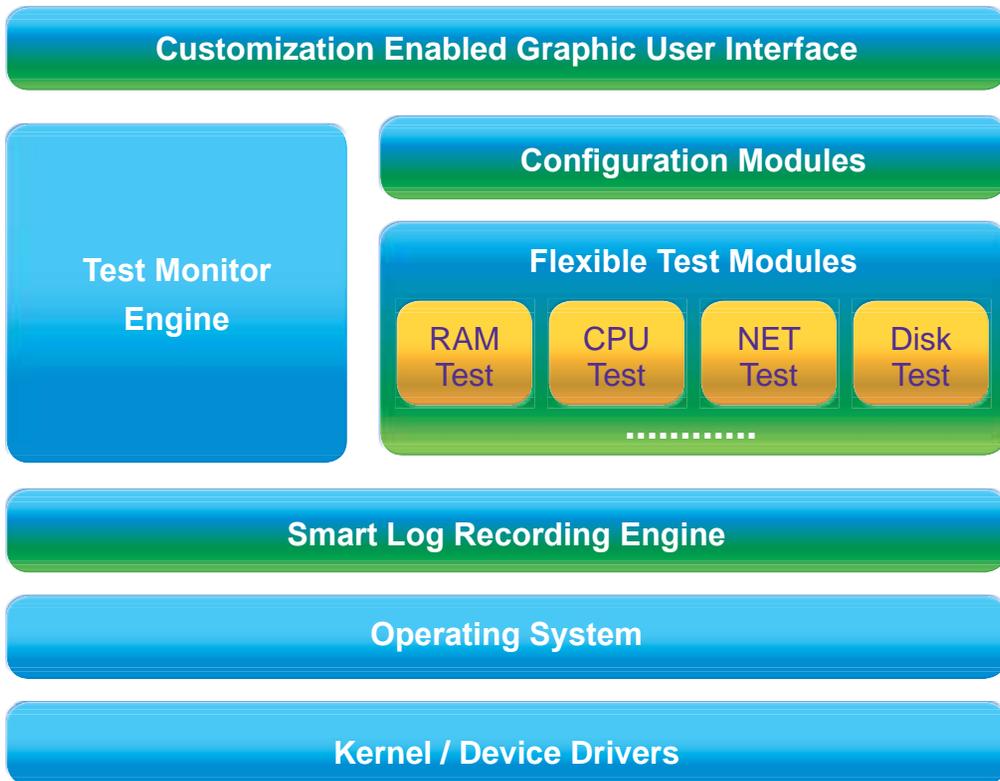


# PQUA / CVER Diagnostic Systems

## Introduction

PQUA (Product **QUAL**ification) is a diagnostic system that can be self-booted and used to identify and monitor the health status of all hardware components. It is designed for providing robust quality with flexible test modules during hardware manufacture phase.

CVER (CASwell **VER**ification) is a highly customized verification system. It meets the requirements of efficiency and immediateness for logistics Hubs, customers, and end users. CVER can be used on any of CASwell machines regardless of what OS system customers have once it's created.



PQUA / CVER Architecture

## Benefits / Features

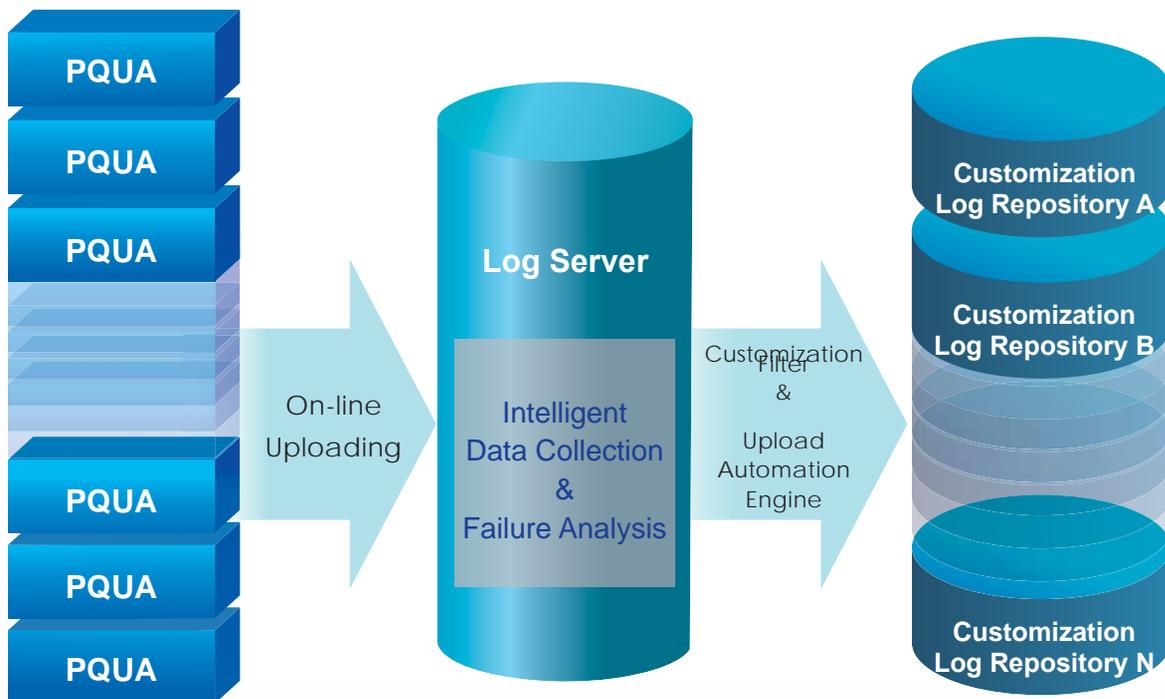
- Abundant Test Modules
- Flexible Test Cases Management
- Automated Logs / Reports Generation
- Selectable Multiple Test Stations
- Customization Configurations
- Easy Integration to Different Linux Distributions
- Logs / Reports Uploading Feature
- Enhancing Reliability Feature
- Support All CASwell Models

# Log Server

## Introduction

The CASwell Log Server provides a powerful engine for storing testing records that helps customers get equipment health reports quickly and easily from everywhere. The testing records generated by PQUA will be automatically processed with well-formatted results and uploaded into dedicated customer log repository database on the Log Server.

Furthermore, CASwell Log Server has very outstanding inspection ability that can be used for failure analyses and avoidance of invisible issues. In other words, it perfects the verification coverage for all CASwell products.



The Log Server Framework

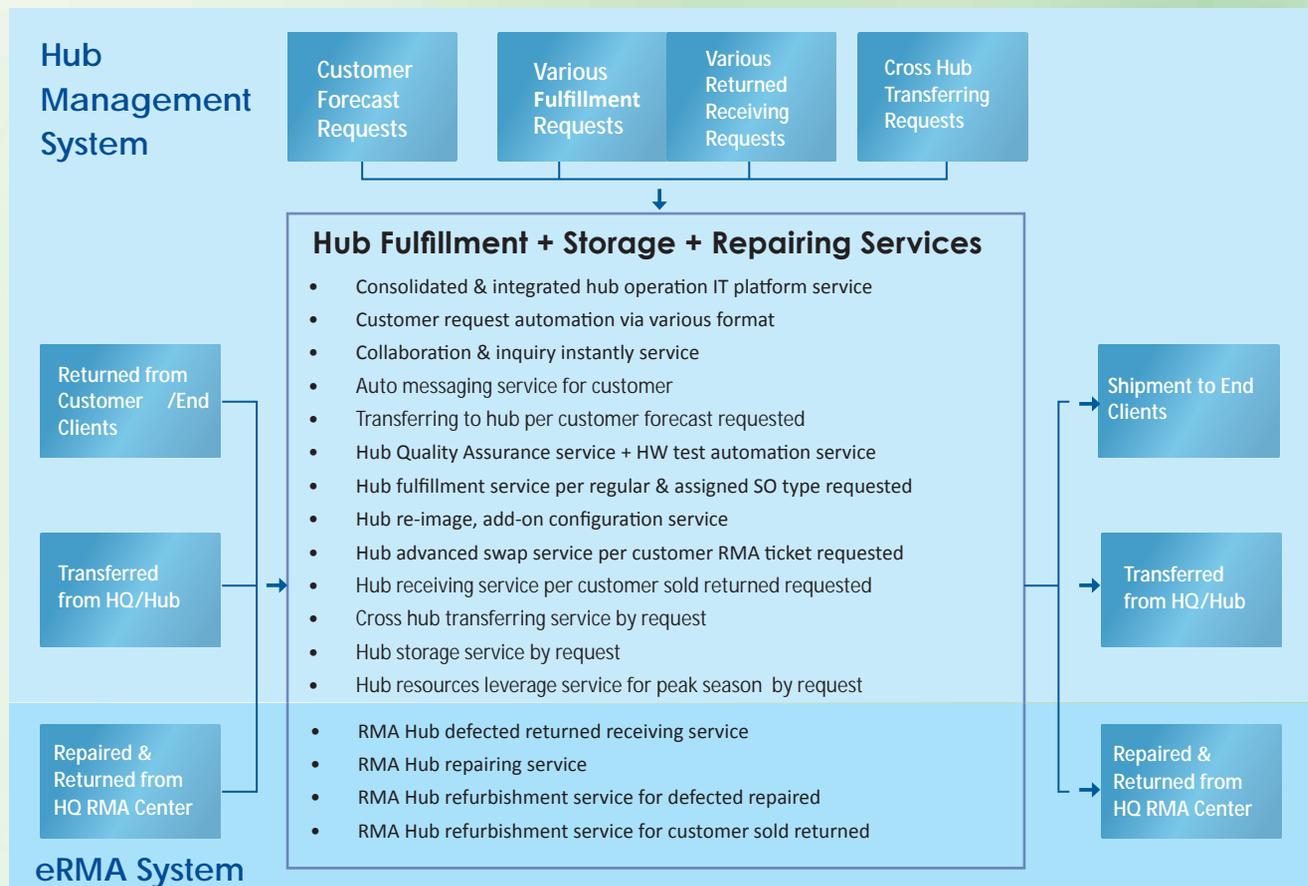
## Benefits / Features

- Powerful Tests Recording Engine
- Customization Filter & Upload Automation Engine
- Intelligent Data Collection & Failure Analysis
- Selectable Download Feature
- Well-formatted Test Results Feature
- Fast Search Engine
- Smart Statistic Report Printing Feature
- Support All CASwell Models

# Global Logistics Service

Providing complete quality service to our customer is CASwell's mission. We provide value with reasonable prices for our products and services, integrated IT support for 24 hour global shipping, add-on/image configuration change, reversed logistics terminal and refurbishment, local RAM Service and a complete testing record for online searching and downloading. CASwell created a global/ local service in order to eliminate time consumption and waste. We also provide a customized platform to meet different needs. Not only does CASwell care about providing great service to our customers, we also strive to provide complete solutions.

- Customization services of the Hub Service
- User Interface customization
- Data transfer format specified
- Web service format specified
- Existing features customization
- New features development
- New service processes implementation



# SaaS Cloud HMS + eRMA



## Global Hub Services

- 24 Hrs Services
- Delivery by request
- Prompt response



## Integrated IT Services

- Integrated info
- Consolidated UI
- Info accessibility



## Global RMA Services

- Shorter RMA Time
- Service is KING
- Time is MONEY



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Copper NIC Module  
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# Haswell

## CAR-4020



Intel® Lynx Point C226 PCH  
 Max. 4 DDR3 ECC Long-DIMMs  
 Max. 3 CASwell NIP Module  
 Form factor\_1U

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## CAR-3045/6/7



Intel® H81/Q87 PCH  
 Max. 2 DDR3 Long-DIMMs  
 Max. 1 CASwell NIP Module  
 Form factor\_1U

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## CAR-3040



Intel® H81/Q87 PCH  
 Max. 2 DDR3 Long-DIMMs  
 Max. 1 CASwell NIP Module  
 Form factor\_1U

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## CAR-2040



Intel® H81 PCH  
 Max. 2 DDR3 Long-DIMMs  
 No CASwell NIP Module  
 Form factor\_1U

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## CAF-2000



Intel® Lynx Point C226 PCH  
 Max. 1 DDR3LSO-DIMM  
 No CASwell NIP Module  
 Form factor\_Desktop

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# BayTrail

## CAD-0225



Intel® J1900SoC  
 Max. 1 DDR3LECC Long-DIMMs  
 No CASwell NIP Module  
 Form factor\_Desktop

P.41

# Rangenley

## CAR-2051



Intel® Atom™ C2000  
Max. 4 DDR3/L Long DIMMs  
1 CASwell NIP Module  
Form factor\_1U

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## CAD-0230



Intel® Atom™ C2000Max.  
2 DDR3 LSO-DIMMs  
No CASwell NIP Module  
Form factor\_Desktop

P.40

# Sandy Bridge/ Ivy Bridge

## CAR-5030



Intel® Patsburg-B C604 PCH  
Max. 16 DDR3 1600 Long-DIMMs  
Max. 5 CASwell NIP Module  
Form factor\_2U

P.26

## CAR-4012



Intel® Cougar Point C206 PCH  
Max. 4 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_2U

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## CAR-4010



Intel® Cougar Point C206 PCH  
Max. 4 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_1U

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## CAR-3035/6/7



Intel® Cougar Point H61 PCH  
Max. 2 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_1U

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## CAR-3030



Intel® H61 PCH  
Max. 2 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_1U

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## CAR-3020



Intel® Cave Creek PCH  
Max. 2 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_1U

P.34

## CAR-2030



Intel® Cougar Point H61 PCH  
Max. 2 DDR3 1333 Long-DIMMs  
Max. 1 CASwell NIP Module  
Form factor\_1U

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# Tilera

## NIP-63xxsx series

4 SFP+  
No Bypass  
Intel® 82599ES LAN Controller



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## CAT-8000



Intel® Cougar Point H61 PCH  
Max. 2 DDR3 1333 DIMMs  
Max. 1 CASwell NIC Module  
Form factor\_1U

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## CAT-5038



Intel® Patsburg-B C604 PCH  
Max. 16 DDR3 1600 DIMMs  
Max. 5 CASwell NIC Module  
Form factor\_2U

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## CAT-5030



Intel® Cougar Point H61 PCH  
Max. 2 DDR3 1333 DIMMs  
Max. 1 CASwell NIC Module  
Form factor\_1U

P.53

## CAT-4020



Intel® Cougar Point H61 PCH  
Max. 2 DDR3 1333 DIMMs  
Form factor\_1U

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# AMD

## CAF-1000



AMD A50M PCH  
Max. 1 DDR3 1066 SO-DIMM  
No CASwell NIP Module  
Form factor\_Fanless Desktop

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## CAD-0220/21



AMD A50M PCH  
Max. 1 DDR3 1066 SO-DIMM  
No CASwell NIP Module  
Form factor\_Desktop

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## CAD-0215



AMD A50M PCH  
Max. 1 DDR3 1066 SO-DIMM  
No CASwell NIP Module  
Form factor\_Desktop

P.43

# Fiber

## NIP-86020

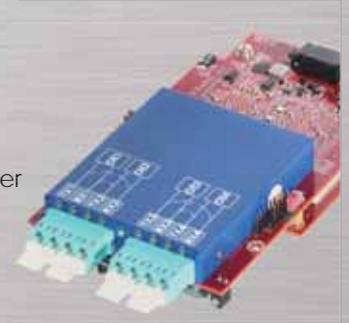
2 Fiber 40GbE Ports  
No Bypass  
Mellanox ConnectX-3 LAN Controller



P.58

## NIP-53240

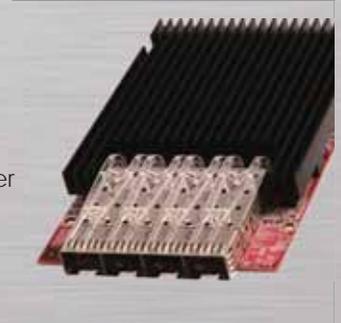
2 SFP+  
2 Segment Bypass  
Intel® 82599ES LAN Controller



P.58

## NIP-53040

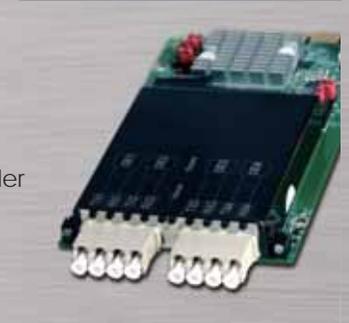
4 SFP+  
No Bypass  
Intel® 82599ES LAN Controller



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## NIP-52240

4 SFP  
2 Segments Bypass  
Intel® 82580EB LAN Controller



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# Hybrid

## NIP-55140

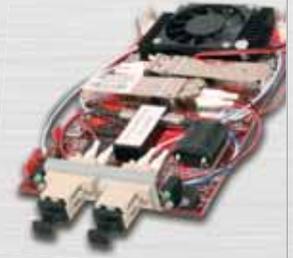
2 x GbE Copper Ports  
2 SFP  
1 Segment Bypass  
Intel® 82580EB LAN Controller



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## NIP-53120

2 SFP+  
1 Segment Bypass  
Intel® 82599ES LAN Controller



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## NIP-53020

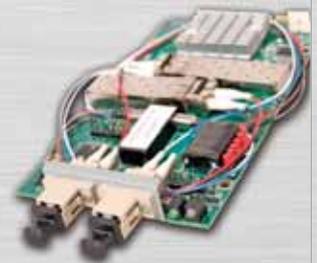
2 SFP+  
No Bypass  
Intel® 82599ES LAN Controller



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## NIP-52120

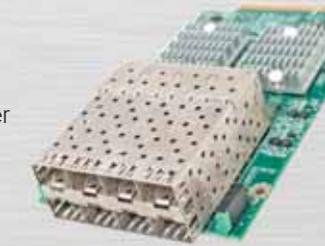
2 SFP  
1 Segment Bypass  
Intel® 82580DB LAN Controller



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## NIP-52080

8 SFP  
No Bypass  
Intel® 82580EB LAN Controller



P.60

## NIP-52040

4 SFP  
No Bypass  
Intel® 82580EB LAN Controller



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## NIP-52020

2 Fiber GbE Ports  
No Bypass  
Intel® 82580DB LAN Controller



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# Copper

## NIP-54021/121

2 10GBASE-T  
1 Segment Bypass (NIP-54121 Only)  
Intel® X540 BT2 LAN Controller



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## NIP-51481

8 Copper GbE Ports  
4 Segments Bypass  
Intel® i350 LAN Controller



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## NIP-51240

4 Copper GbE Ports  
2 Segments Bypass  
Intel® 82580EB LAN Controller



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## NIP-51080

8 Copper GbE Ports  
No Bypass  
Intel® 82580EB LAN Controller



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## NIP-51040

4 Copper GbE Ports  
No Bypass  
Intel® 82580EB LAN Controller



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# Standard NIC

## NIP-71040

4 Cooper GbE Ports  
No Bypass  
Intel® i210AT LAN Controller



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## BPC-54120

2 Fiber 10GbE Ports  
1 Segment Bypass  
Intel® 82599ES LAN Controller



P.62

## BPC-53120

2 Fiber 10GbE Ports  
1 Segment Bypass  
Intel® 82599ES LAN Controller



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## BPC-51243

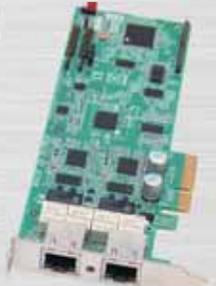
4Cooper GbE Ports  
2 Segments Bypass  
Intel® i350AM4 LAN Controller



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## BPC-51120

2 Copper GbE Port  
1Segment Bypass  
Intel® i210AT LAN Controller



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## NIP-50120

2 Copper 10/100 EthernetPort  
1Segment Bypass  
Intel® i210AT LAN Controller



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# Security and Accessories

## NIP-71042

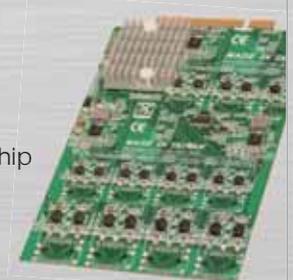
4 Copper GbE Ports  
No Bypass  
Intel® Cave Creek+BROADCOM  
PHY Chip



P.65

## NIP-70001

No Port  
No Bypass  
Cavium NITROX® PX CN1620 Chip



P.65

### NIP-70000

No Port  
No Bypass  
Cavium NITROX® PX CN1610-P  
Chip



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### NIP-62041

4 Fiber GbE Ports  
No Bypass  
Intel® 82580EB LAN Controller  
+Cavium CN1620 Chip



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### NIP-61042

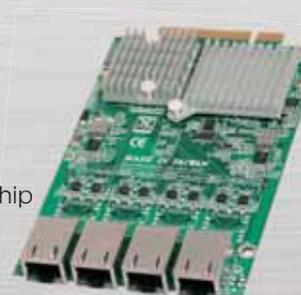
4 Fiber GbE Ports  
No Bypass  
Intel® 82580EB LAN Controller  
+Cavium CN1610-P Chip



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### NIP-61041

4 Copper GbE Ports  
No Bypass  
Intel® 82580EB LAN  
Controller+Cavium CN1620 Chip



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# Reference Table



MODEL	CAR-5030	CAR-4012	CAR-4020	CAR-4010
CPU Board	Intel® Ivy-Bridge-EP	Intel® Ivy Bridge	Intel® 4th Gen. Xeon® Processor	Intel® Ivy Bridge
Chipset	Intel® Patsburg-B PCH	Intel® Cougar point C206 PCH	Intel® Lynx Point C226 PCH	Intel® Cougar point C206 PCH
System Memory	16 DDR3 ECC Long-DIMMs, up to 128GB	4 DDR3 ECC Long-DIMMs, up to 32GB	4 DDR3 ECC Long-DIMMs, up to 32GB	4 DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 50 GbE RJ45/SFP	Up to 4 GbE RJ45 & 4 SFP Up to 8 GbE RJ45	Up to 24 GbE RJ45/SFP	Up to 4 GbE RJ45 & 4 SFP Up to 8 GbE RJ45
Bypass	Based on CASwell NIC Module or Standard add-on card	2 Segments	Base on CASwell NIC	2 Segments
Expansion	Up to 5 PCIe x8 Gen2 for CASwell NIC Module Up to 4 PCIe x4/ x8 Gen 3 Standard add-on card	1 PCIe x8 Gen2 for CASwell NIC Module 1 PCIe x4 Gen2 for Standard add-on card	1 PCIe x8, 1 PCIe x4,x4 Gen3 for CASwell NIC Module 1 PCIe x4/x2 Gen2 for CASwell NIC Module 1 PCIe x8 Gen2 for Standard add-on card	1 PCIe x8 Gen2 for CASwell NIC Module 1x PCIe x4, One PCIe x8 Gen2 for Standard add-on card
Storage Device	2x 3.5" Swappable SATA/SAS HDDs CF Socket	2x 3.5" or 4x 2.5" SATA HDDs CF socket	1x 3.5" or 4x 2.5" SATA HDD CF socket	2x 3.5" or 2x 2.5" SATA HDDs (internal) CF Socket
Serial Port	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32/64 Graphic	2x16 Characters 128x32/64 Graphic	2x16 Characters	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet/ Bypass	Power/ HDD	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0	Dual USB 2.0	Dual USB 3.0	Dual USB 2.0
VGA	Optional from LOM or VGA module	Optional for LOM version only	2x5 pin-header	2x5 pin-header
LOM	IPMI 2.0 w/ GbE speed (Optional)	IPMI 2.0 w/ Fast Ethernet speed (Optional)	IPMI 2.0 w/ GbE speed (Optional)	IPMI 2.0 w/ Fast Ethernet speed (Optional)
Power	500W/ 600W 2U Mini redundant	300W 2U Redundant	280W 1U Redundant 250W 80Plus ATX 250W DC 48V input	275W 1U Redundant 250W 80Plus ATX 250W DC 48V input
Dimension	438(W) x 645(D) x 88.5(H)mm 17.24"(W) x 24.65"(D) x 3.5"(H)	438(W) x 509.4(D) x 88(H)mm 17.24"(W) x 20.06"(D) x 3.46"(H)	438(W) x 483(D) x 44(H)mm 17.24"(W) x 19.02"(D) x 1.73"(H)	438(W) x 509(D) x 44(H)mm 17.24"(W) x 20.04"(D) x 1.73"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20% to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -20 to 70°C (-4 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel	Linux Kernel
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# Reference Table



MODEL	CAR-3045/46/47	CAR-3040	CAR-3035/36/37	CAR-3030
CPU Board	Intel® Haswell	Intel® Haswell	Intel® LGA1155	Intel® LGA1155
Chipset	Intel® H81/Q87 PCH	Intel® H81/Q87 PCH	Intel® H61 PCH	Intel® H61 PCH
System Memory	2 DDR3 Long DIMMs, up to 16GB	2 DDR3 Long DIMMs, up to 16GB	2 DDR3 Long-DIMMs, up to 16GB	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 18 GbE RJ45	Up to 18 GbE RJ45	Up to 14 GbE RJ45/SFP	Up to 14 GbE RJ45/SFP
Bypass	2 segments	2 segments	2 Segments	2 Segments
Expansion	1 PCIe x8 Gen 2 for CASwell NIC module and standard add-on cards	1 PCIe x8 Gen 2 for CASwell NIC module and standard add-on cards	1 PCIe x8 Gen 2 for CASwell NIC Module 2 PCIe x8 Gen2 for CASwell NIC Module or Standard add-on cards (Project Based)	1 PCIe x8 CASwell NIC Module or Standard add-on cards
Storage Device	1x 3.5" or 2x 2.5" SATA HDD CFEX socket	1x 3.5" or 2x 2.5" SATA HDD CFEX socket	2x 3.5" or 2x 2.5" SATA HDDs CF Socket	1x 3.5" or 2x 2.5" SATA HDD CF Socket
Serial Port	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-head	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32 / 64 Graphic	2x16 Characters 128x32/64 Graphic	2x16 Characters 128x32/64 Graphic	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet / Bypass	Power/ HDD/ Ethernet / Bypass	Power/ HDD/ Ethernet/ Bypass	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 3.0	Dual USB 3.0	Dual USB 2.0	Dual USB 2.0
VGA	2x5 pin-header	2x5 pin-header	2x5 pin-header	2x5 pin-header
LOM	N/A	N/A	N/A	N/A
Power	275W Redundant 250W 80Plus ATX 250W DC 48V Input	250W 80Plus ATX	275W Redundant (CAR-3035) 250W 80Plus ATX (CAR-3036) 250W DC48V Input (CAR-3037)	250W 80Plus ATX
Dimension	438(W) x 407(D) x 44(H)mm 17.24"(W) x 16"(D) x 1.73"(H)	438(W) x 292(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)	443(W) x 407(D) x 44(H)mm 17.44"(W) x 16.02"(D) x 1.73"(H)	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 80%RH	Temp: 5 to 35°C (41 to 95°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 10 to 90%RH @ 55°C	Temp: -20 to 70°C (-4 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel	Linux Kernel
PAGE	30	31	32	33

# Reference Table



MODEL	CAR-3020	CAR-2051	CAR-2040	CAR-2030
CPU Board	Intel® Gladden	Intel® Atom™ Processor C2000 product family	Intel® Haswell	Intel® LGA1155
Chipset	Intel® Cave Creek PCH	N/A	Intel® H81 PCH	Intel® H61 PCH
System Memory	2 DDR3 Long-DIMMs, up to 16GB	4 DDR3L ECC Long-DIMMs, up to 32GB	2 DDR3 Long DIMMs, up to 16GB	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 6 GbE RJ45	Up to 16 GbE RJ45/SFP	Up to 4 GbE RJ45	Up to 4 GbE RJ45
Bypass	2 Segments	2 Segments	N/A	NA
Expansion	1 PCIe x8 for CASwell NIC Module or Standard add-on card	1 PCIe x8 Gen. 2 for CASwell NIC Module 1 PCIe x8 Gen. 2 for Standard add-on card	N/A	N/A
Storage Device	1x 3.5" or 2x 2.5" SATA HDD CF Socket	1x 3.5" or 4x 2.5" SATA/SAS HDDs CFEX socket	1x 3.5" or 1x 2.5" SATA HDD CFEX slot	1x 3.5" or 2x 2.5" SATA HDD CF Socket
Serial Port	RJ45 system console 2x5 pin-header	RJ45 system console	RJ45 system console	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic	128x 32/64 Graphic	N/A	N/A
LED	Power/ HDD/ Ethernet/ Bypass	Power/ HDD/ Ethernet/ Bypass	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet
USB	Dual USB 2.0	Dual USB 2.0	Dual USB 2.0	Dual USB 2.0
VGA	N/A	N/A	2x5 pin-header	2x5 pin-header
LOM	N/A	N/A	N/A	N/A
Power	250W 80Plus ATX	150W 80Plus ATX	150W Single ATX	250W 80Plus ATX
Dimension	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)	438(W) x 292.1(D) x 44(H) mm 17.24"(W) x 11.5"(D) x 1.73"(H)	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)	438(W) x 292(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel	Linux Kernel
PAGE	34	35	36	37

# Reference Table



MODEL	CAF-2000	CAF-1000	CAD-0230
CPU Board	Intel® Haswell Mobile	AMD T24L	Intel® Rangeley Atom™ Processor SOC
Chipset	N/A	A50M Chipset	N/A
System Memory	1 DDR3L SO-DIMM, up to 8 GB	1 SO-DIMM DDR3, up to 4GB	2 DDR3/L SO-DIMMs, up to 16GB
Ethernet Port	Up to 6 GbE RJ45	Up to 4 GbE RJ45	6 GbE RJ45
Bypass	1 Segment	N/A	1 Segment
Expansion	N/A	N/A	N/A
Storage Device	1x 2.5" SATA SSD CFEX socket	CF socket	1x 2.5" SATA/SAS HDD CFEX Socket
Serial Port	RJ45 system console	RJ45 system console	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic	N/A	N/A
LED	Power/ HDD/ Ethernet	Power/ Ethernet	Power/ HDD/ Ethernet/Bypass
USB	Dual USB 3.0	Dual USB 2.0	Dual USB 2.0
VGA	N/A	N/A	N/A
LOM	N/A	N/A	N/A
Power	60 W 12V Adapter	24W 12V DC Adapter	40W 12V DC adapter(TBD)
Dimension	280(W) x 175(D) x 43(H)mm 11.02"(W) x 6.89"(D) x 1.69"(H)	201(W) x 112(D) x 44(H)mm 7.91"(W) x 4.41"(D) x 1.73"(H)	210(W) x 210(D) x 42(H)mm 8.27"(W) x 8.27"(D) x 1.65"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 5 to 35°C (41 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel
PAGE	38	39	40

# Reference Table



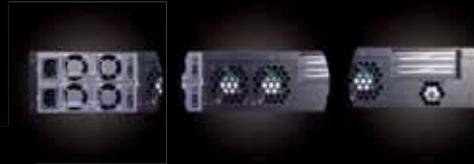
MODEL	CAD-0225	CAD-0220/0221	CAD-0215
CPU Board	Intel® J1900	AMD T48E/ T50E A50M Chipset	AMD T24L A50M Chipset
System Memory	1 DDR3L 1333 SO-DIMMs, up to 8GB	1 DDR3 SO-DIMM, up to 4GB	1 DDR3 SO-DIMM, up to 4GB
Ethernet Port	4 GbE RJ45	Up to 6 GbE RJ45	Up to 4 GbE RJ45
Bypass	N/A	1 Segment	N/A
Expansion	N/A	N/A	N/A
Storage Device	1x 2.5" SATA HDD	1x 2.5" SATA HDD CF Socket	CF Socket
Serial Port	RJ45 system console	RJ45 system console	RJ45 system console
LCD Panel	N/A	CF Socket	N/A
LED	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet/ Bypass	Power/ HDD/ Ethernet
USB	Dual USB 2.0	Dual USB 2.0	Dual USB 2.0
VGA	2x5 pin-header	2x5 pin-header (CAD-0221)	N/A
LOM	N/A	N/A	N/A
Power	40W 12V DC Adapter	40W 12V DC Adapter	24W 12V DC Adapter
Dimension	180(W) x 145(D) x 44(H)mm 7.08"(W) x 5.71"(D) x 1.73"(H)	210(W) x 210(D) x 42(H)mm 8.27"(W) x 8.27"(D) x 1.65"(H)	165(W) x 105.5(D) x 43(H)mm 6.5"(W) x 4.15"(D) x 1.69"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH @ 55°C	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel
PAGE	41	42	43

# CAR-5030

Intel® Romley-EP platform, maximum support up to 50 GbE ports

The CAR-5030 is built with dual Intel® Ivy Bridge Processors and Patsburg chipset, has the greatest computing power to meet any applications of network appliances. Highly flexibility supports max. 5 expansion slots with all CASwell proprietary Network Modules, it's the total solution of all network applications, especially for UTM/ Security/ Networking application.

x86-2U Architecture

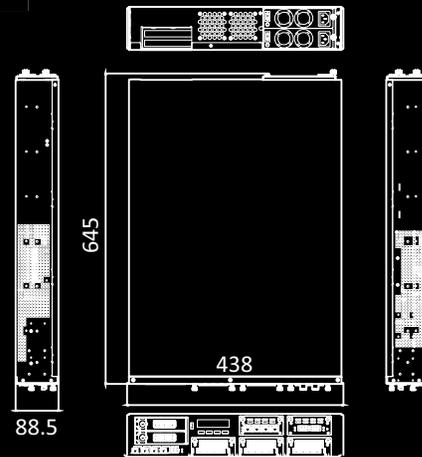


## Feature

- Dual Intel® Ivy Bridge-BP socket R type processor
- Up to 16 cores. 40MB cache, 4 QPI links
- 16 DIMMs 1600 DDR3. Max Memory Size: 128GB (base on memory and 4U spec.)
- Up to five PCIe x8 CASwell proprietary NIC (project based)
- Expansion up to three standard PCIe x8 and one PCIe x4 add-on cards (project based)
- GbE speed IPMI v2.0 module

## SPECIFICATION

CPU Board	Intel® Ivy Bridge-EP
PCH/ Chipset	Intel® Patsburg-B PCH
System Memory	16 DDR3 ECC Long-DIMMs, up to 128GB
Ethernet Port	Up to 50 GbE RJ45/SFP
Bypass	Based on CASwell NIC Module or Standard add-on card
Expansion	Up to 5 PCIe x8 Gen. 2 for CASwell NIC Module Up to 4 PCIe x4/ x8 Gen. 3 Standard add-on card
Storage Device	2x 3.5" Swappable SATA/SAS HDDs CF Socket
Dimension	438(W) x 645(D) x 88.5(H)mm 17.56"(W) x 24.65"(D) x 3.5"(H)
Power	500W/ 600W 2U Mini redundant



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32/64 Graphic
LEDS	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	Optional from LOM or VGA module
LOM	IPMI 2.0 w/ GbE speed (Optional)

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E5-2680v2	8/16	2.1 GHz	20 M	95 W
E5-2658v2	6/12	2.0 GHz	15 M	95 W
E5-2648Lv2	8/16	1.8 GHz	20 M	70 W
E5-2640v2	8/16	2 GHz	20 M	95 W
E5-2628Lv2	8/16	1.9 GHz	20 M	70 W
E5-2630v2	6/12	2.6 GHz	15 M	80 W
E5-2618Lv2	6/12	2 GHz	15 M	50 W
E5-2658	8/16	2.1 GHz	20 M	95 W
E5-2648L	8/16	1.8 GHz	20 M	70 W
E5-2620	8/16	2.0 GHz	15 M	95 W

# CAR-4012

Intel® Bromolow Platform (Intel® C206), Up to 16GbE, IPMI 2.0

The CAR-4012 is designed for the small-medium business. This Intel® C206 based communication appliance supports Intel® Xeon® processor E3-1200 v2 and Intel® Xeon® processor E3-1200 product families in one socket 2U rack-mount platform. The CAR-4012 delivers a great advantage of dependability and productivity by providing new levels of cost effective data protection, performance, expanded security, virtualization, and power management options.

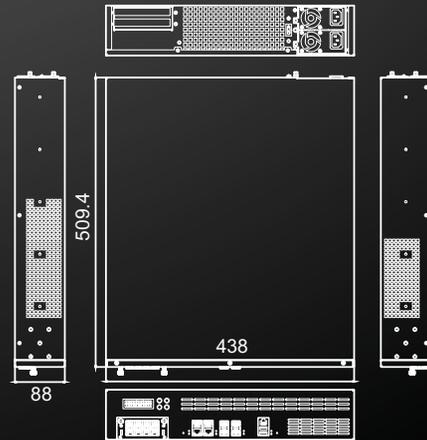


## Feature

- Intel® Xeon® Processor
- Option IPMI 2.0 with iKVM
- 2U Rackmount
- Support DDR3 memory with ECC
- Up to 16GbE

## SPECIFICATION

CPU Board	Intel® Sandy Bridge/ Ivy Bridge
PCH/Chipset	Intel® Cougar Point C206
System Memory	4 DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 4 GbE RJ45 & 4 SFP Up to 8 GbE RJ45
Bypass	2 Segments
Expansion	1 PCIe x8 Gen. 2 for CASwell NIC Module 1 PCIe x4 Gen. 2 for Standard add-on card
Storage Device	2x 3.5" or 4x 2.5" SATA HDDs CF socket
Dimension	438(W) x 509.4(D) x 88(H)mm 17.24"(W) x 20.06"(D) x 3.46"(H)
Power	300W 2U Redundant



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -20 to 70°C (-4 to 158°F) 5 to 95%RH @55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	Optional for LOM version only
LOM	IPMI 2.0 w/ Fast Ethernet speed (Optional)

## Optional CPUs

Intel Code name	Model	Cores/Threads	Frequency	Cache	TDP
Sandy Bridge	E3-1275	4/8	3.40 GHz	8M	95 W
Sandy Bridge	E3-1225	4/4	3.10 GHz	6M	95 W
Sandy Bridge	i3-2120	2/4	3.30 GHz	3M	65 W
Ivy Bridge	E3-1275V2	4/8	3.50 GHz	8M	77 W
Ivy Bridge	E3-1225V2	4/4	3.20 GHz	8M	77 W

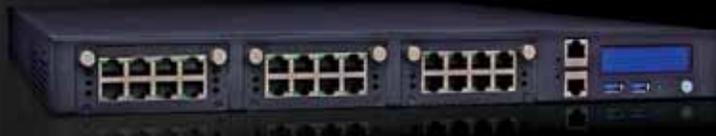
# CAR-4020

The 1U Network Appliance with support for Intel® 4<sup>th</sup> Gen. Xeon Processor and C226 Chipset which Scales up to 24GbE.

CAR-4020 has highly scalability and flexibility to fulfill your diversify network security and management application in different scales, such as WOC, ADC, UTM, CDN...etc. Modular design with 3 expansion slots can mix and meet your network and storage purpose with up to 24GbE or 4x 2.5" Swappable HDD/SSD. And the IPMI provides the added value of server grade remote monitor and control capability for you appliance.



x86-1U Architecture

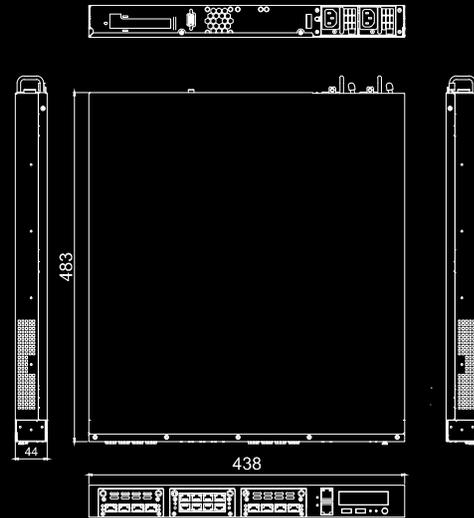


## Feature

- 4<sup>th</sup> Generation Intel® Core™ Processor w/ Intel® C226 Chipset Platform
- High Scalability with 3 Expansion Slots
- Provide Maximum 24 GbE ports or Maximum 4 x 2.5" Swappable HDD or SSD.
- 1 GbE, 10 GbE, CASwell NIC modules or Intel® Cave Creek, Tlera Gx36 Acceleration modules supported
- Modularized IPMI function supported
- Integrated LCM control button

## SPECIFICATION

CPU Board	Intel® 4 <sup>th</sup> Gen. Xeon® Processor
PCH/Chipset	Intel® Lynx Point C226 PCH
System Memory	4 DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 24 GbE RJ45/ SFP
Bypass	Base on CASwell NIC
Expansion	1 PCIe x8, 1 PCIe x4, x4 Gen. 3 for CASwell NIC Module 1 PCIe x4, x2 Gen. 2 for CASwell NIC Module 1 PCIe x8 Gen. 2 for Standard add-on card
Storage Device	1x 3.5" or 4x 2.5" SATA HDD CF socket
Dimension	438(W) x 483(D) x 44(H)mm 17.14"(W) x 19.02"(D) x 1.73"(H)
Power	300W 1U Redundant 250W 80Plus ATX 250W DC 48V input



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters
LED	Power/ HDD
USB	Dual USB 3.0
LOM	IPMI 2.0 w/ Fast Ethernet speed (Optional)

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E3-1275 v3	4C/8T	3.5GHz	8M	95W
E3-1225 v3	4C/4T	3.2GHz	8M	95W
E3-1268 v3	4C/8T	2.3GHz	8M	45W
i3-4330	2C/4T	3.5GHz	3M	54W
Pentium G3420	2C/2T	3.2GHz	3M	54W

# CAR-4010

Intel® Bromolow platform. Ivy Bridge & C206. Support up to 20 GbE ports

x86-1U Architecture

CAR-4010 is the best solution of network security and management applications for small-medium business. Xeon processors family – Ivy (Sandy) Bridge CPU with C206 chipset provides the greatest computation but effective power consumption. A full range applications by CASwell proprietary NIC modules support up to 8 internet connectors with any interface requirement to meet any requirements.



## Feature

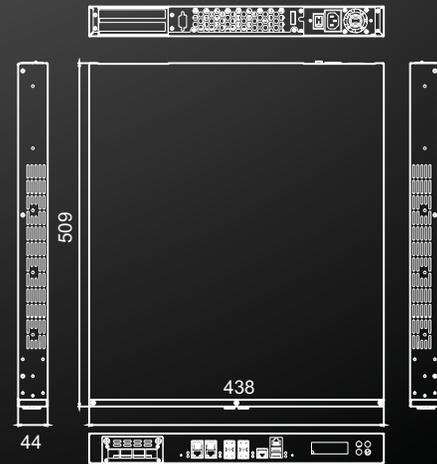
- Support Intel® LGA1155 Xeon® series CPU
- Four DIMMs DDR3 1066/ 1333. Max up to 32GB
- 8 GbE ports (copper or fiber) with two segments bypass
- Expandable with 10GbE ports (copper or SFP)
- Optional GbE speed IPMI v2.0

### SPECIFICATION

CPU Board	Intel® Ivy Bridge
PCH/Chipset	Intel® Cougar Point C206
System Memory	4 DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 4 GbE RJ45 & 4 SFP Up to 8 GbE RJ45
Bypass	2 Segments
Expansion	1 PCIe x8 Gen2 for CASwell NIC Module 1 PCIe x4, 1 PCIe x8 Gen2 for Standard add-on card
Storage Device	2x 3.5" or 4x 2.5" SATA HDDs CF socket
Dimension	438(W) x 509.4(D) x 88(H)mm 17.24"(W) x 20.06"(D) x 3.46"(H)
Power	275W 1U Redundant 250W 80Plus ATX 250W DC 48V Input

### FRONT PANEL

Serial Port	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	IPMI 2.0 w/ Fast Ethernet speed (Optional)



### OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) -5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E3-1275	4/8	3.4 GHz	8M	95W
E3-1225	4/4	3.1 GHz	6M	95W
G850	2/2	2.9 GHz	3M	65W
i3-2120	2/4	3.3 GHz	3M	65W
G540	2/2	2.5 GHz	2M	65W
E3-1275V2	4/8	3.5 GHz	8M	77W
E3-1225V2	4/4	3.2 GHz	8M	77W
G2120	2/2	3.1GHz	3M	55W
i3-3220	2/4	3.3GHz	3M	55W

# CAR-3045/46/47

Intel® Haswell Platform, Maximum support up to 18 GbE Ports

CAR-3045/6/7 is built with Intel® Haswell Processors and H81/Q87 chipset, up to 13% more CPU performance with lower power than Gen. 3 Intel® Core™ processor family. With high flexibility supports CASwell Network modules up to 18 GbE RJ45, also variety of power supply for UTM/ Network application.

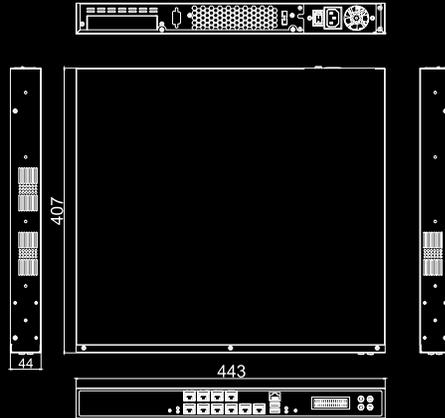


## Feature

- Intel® 4th Generation Core™ Processors
- Two DIMMs DDR3 up to 16GB
- Up to 18 GbE ports
- Redundant, AC and DC power solution
- One expandable CASwell NIP card support
- One 3.5" or two 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® Haswell
PCH/Chipset	Intel® H81/Q87 PCH
System Memory	2 DDR3 Long DIMMs, up to 16GB
Ethernet Port	Up to 18 GbE RJ45
Bypass	2 segments
Expansion	1 PCIe x8 CASwell NIC module and standard add-on cards
Storage Device	1x 3.5" or 2x 2.5" SATA HDD CFEX socket
Dimension	443(W) x 406(D) x 44(H)mm 17.44"(W) x 16"(D) x 1.73"(H)
Power	275W Redundant 250W 80Plus ATX 250W DC 48V Input



## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 3.0
VGA	2x5 pin-header
LOM	N/A

## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 80%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
i7-4770S	4C/8T	3.1	8M	65W
i5-4570S	4C/4T	2.9	6M	65W
i3-4330	2C/4T	3.5	4M	54W
Pentium G3420	2C/2T	3.2	3M	54W
Celeron G1820	2C/2T	2.7	2M	54W

# CAR-3040

Intel® Haswell Platform, Maximum support up to 18 GbE Ports

x86-1U Architecture

CAR-3040 is built with Intel® Haswell Processors and H81/Q87 chipset, up to 13% more CPU performance with lower power than Gen. 3 Intel Core processor family. With high flexibility supports CASwell Network modules up to 18 GbE RJ45. CAR-3040 is a High performance and competitive price product for UTM /Network application.



## Feature

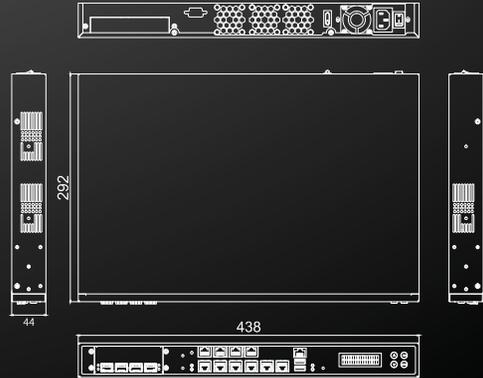
- Intel® 4th Generation Core™ Processors
- Two DIMMs DDR3 up to 16GB
- Up to 18 GbE ports
- One expandable CASwell NIP card support
- One 3.5" or two 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® Haswell
PCH/Chipset	Intel® H81/Q87 PCH
System Memory	2 DDR3 Long DIMMs, up to 16GB
Ethernet Port	Up to 18 GbE RJ45
Bypass	2 segments
Expansion	1 PCIe x8 CASwell NIC module or standard add-on cards
Storage Device	1x 3.5" or 2x 2.5" SATA HDD CFEX socket
Dimension	438(W) x 292(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	250W 80Plus ATX

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	2x16 Characters 128x32 / 64 Graphic
LED	Power/ HDD/ Ethernet / Bypass
USB	Dual USB 3.0
VGA	2x5 pin-header
LOM	N/A



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 80%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 10 to 90%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
i7-4770S	4C/8T	3.1	8M	65W
i5-4570S	4C/4T	2.9	6M	65W
i3-4330	2C/4T	3.5	4M	54W
Pentium G3420	2C/2T	3.2	3M	54W
Celeron G1820	2C/2T	2.7	2M	54W

# CAR-3035/36/37

Intel® Sugar Bay Platform, Sandy Bridge, Ivy Bridge & H61 maximum support up to 16 GbE Ports

The CAR-3035/6/7, network communications platform from CASwell, takes full advantage the Intel® Sandy Bridge & Ivy Bridge CPU to provide a flexible, fast, and efficient solution for network security applications such as firewalls, VPN, intrusion detection systems/intrusion prevention systems (IDS/IPS), anti-spam, anti-virus, unified threat management (UTM).



x86-1U Architecture

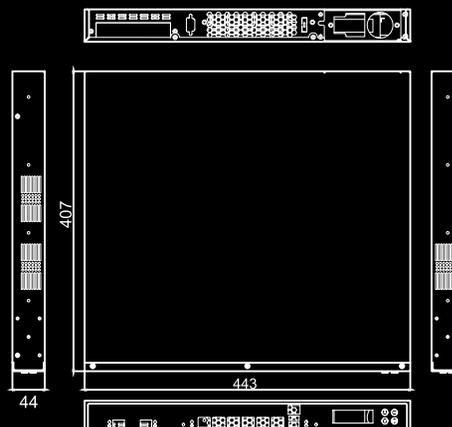
## Feature

- Intel® LGA1155 Sandy Bridge(32nm) & Ivy Bridge(22nm) CPU
- Two DIMMs DDR3 1333 up to 16GB
- 6 GbE ports with two Bypass segment
- Expandable with 10GbE CASwell NIC (10G copper or SFP+)
- One 3.5" or two 2.5" internal SATA HDD



## SPECIFICATION

CPU Board	Intel® LGA1155
PCH/Chipset	Intel® H61 PCH
System Memory	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 16 GbE RJ45/ SFP
Bypass	2 segments
Expansion	1 PCIe x8 Gen 2 for CASwell NIC Module 2 PCIe x8 Gen 2 for CASwell NIC Module or Standard Add-on Cards (Project Based)
Storage Device	2x 3.5" or 2x 2.5" SATA HDDs CF Socket
Dimension	443(W) x 407(D) x 44(H)mm 17.44"(W) x 16.02"(D) x 1.73"(H)
Power	275W Redundant (CAR-3035) 250W 80Plus ATX (CAR-3036) 250W DC48V Input (CAR-3037)



## OPERATION

Operating Environment	Temp: 5 to 35°C (41 to 95°F) 20 to 90%RH
Storage Environment	Temp: -20 to 70°C (-4 to 158°F) 5 to 95%RH @55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	N/A

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
i7-2600	4/8	3.40 GHz	8M	95 W
i5-2400	4/4	3.10 GHz	6M	95 W
i3-2120	2/4	3.30 GHz	3M	65 W
G850	2/2	2.90 GHz	3M	65 W
G540	2/2	2.50 GHz	2M	65 W
I7-3770	4/8	3.90 GHz	8MB	77W
I5-3550S	4/4	3.70 GHz	6MB	65W
i3-3220	2/4	3.30 GHz	3M	55W
G2120	2/2	3.10 GHz	3M	55W

# CAR-3030

Intel® Sugar bay platform. Sandy Bridge, Ivy Bridge & H61.Max support up to 14 GbE ports

The CAR-3030, network communications platform from CASwell, takes full advantage the Intel Sandy Bridge & Ivy Bridge CPU to provide a flexible, fast, and efficient solution for network security applications such as firewalls, VPN, intrusion detection systems/intrusion prevention systems (IDS/IPS), anti-spam, anti-virus, unified threat management (UTM).



## Feature

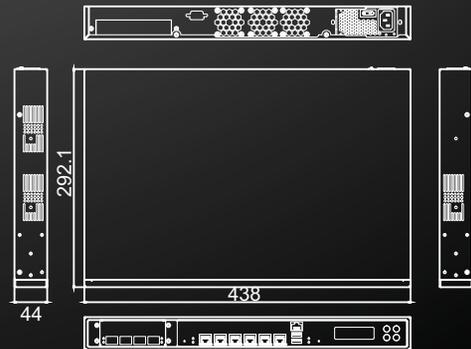
- Intel® LGA1155 Sandy Bridge(32nm) & Ivy Bridge(22nm) CPU
- Two DIMMs DDR3 1333 up to 16GB
- 6 GbE ports with two Bypass segment
- Expandable with 10GbE CASwell NIC (10G copper or SFP+)
- One 3.5" or two 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® LGA1155
PCH/Chipset	Intel® H61 PCH
System Memory	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 14 GbE RJ45/ SFP
Bypass	2 Segments
Expansion	1 PCIe x8 Gen. 2 for CASwell NIC Module or Standard add-on card
Storage Device	1x 3.5" or 2x 2.5" SATA HDD CF Socket
Dimension	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	250W 80Plus ATX

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	N/A



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
i7-2600	4/8	3.40 GHz	8M	95 W
i5-2400	4/4	3.10 GHz	6M	95 W
i3-2120	2/4	3.30 GHz	3M	65 W
G850	2/2	2.90 GHz	3M	65 W
G540	2/2	2.50 GHz	2M	65 W
I7-3770	4/8	3.90 GHz	8MB	77W
I5-3550S	4/4	3.70 GHz	6MB	65W
i3-3220	2/4	3.30 GHz	3M	55W
G2120	2/2	3.10 GHz	3M	55W

# CAR-3020

Intel® Crystal Forest-G/adden Platform

The CAR-3020 built with Intel® Sandy Bridge Core™ E3 Processor with Cave Creek PCH, supports the best computing performance and QAT (Quick Assist Technology) technology. It's designed to optimize algorithm accelerators and network transmission. It can fulfill your mid-level 1U solution from Sandy Bridge Core™ E3 processo most of requirements.

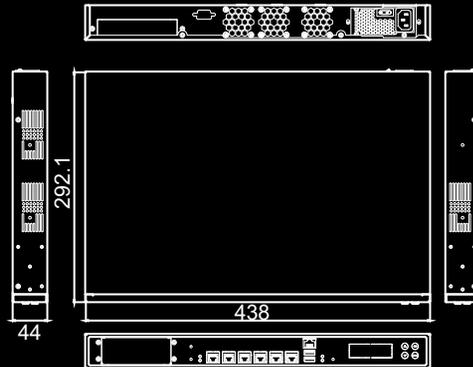


## Feature

- Intel® Sandy Bridge Core™ E3 processor
- Two DIMMs DDR3 1333 up to 16GB
- 6 GbE ports with two Bypass segment
- Expandable with 10GbE CASwell NIC (10G copper or SFP+)
- One 3.5" or two 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® Gladden
PCH/Chipset	Intel® Cave Creek PCH
System Memory	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 6 GbE RJ45
Bypass	2 Segments
Expansion	1 PCIe x8 Gen 2 for CASwell NIC Module or Standard add-on card
Storage Device	1x 3.5" or 2x 2.5" SATA HDDs CF Socket
Dimension	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	250W 80Plus ATX



## FRONT PANEL

Serial Port	RJ45 system console 2x5 pin-header
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	N/A
LOM	N/A

## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E3-1125C	4/8	2.00 GHz	8M	40W
i3-2115C	4/4	2.10 GHz	3M	20W

# CAR-2051

The latest CASwell 1U Network Appliance based on the new Intel® Atom™ processor C2000 product family SoC, Maximum support up to 16 GbE Ports

x86-2U Architecture

To deal with the escalating number and variety of online threats, network security appliances require significantly more compute power and flexibility. To be good citizens in the data center and other space-constrained environments, however, network security devices also need low power and a small footprint.



## Feature

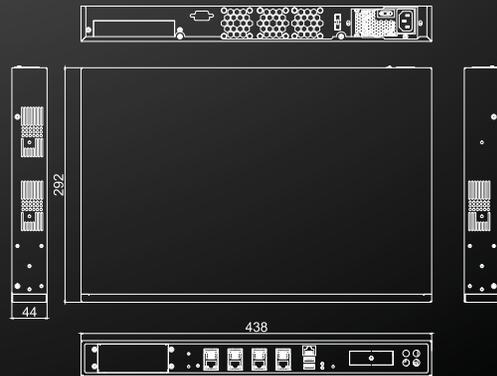
- Intel® Atom™ processor C2000 product family SoC
- 8 cores SoC. 2.4GHz with Intel QAT.
- 4 Long DIMMs 1333 DDR3/L with ECC. Max Memory Size: 32GB
- 1 PCIe 8 CASwell proprietary NIC
- 1 standard PCIe add-on card

## SPECIFICATION

CPU Board	Intel® Atom™ processor C2000 product family SoC
PCH/Chipset	N/A
System Memory	4 DDR3/L ECC long DIMM, up to 32GB
Ethernet Port	Up to 16 GbE ports
Bypass	2 Segments
Expansion	1 PCIe x8 for CASwell NIC Module 1 PCIe x8 Standard add-on card
Storage Device	1x 3.5" or 2x 2.5" SATA/SAS HDDs CFEX Socket
Dimension	438(W) x 292(D) x 44(H) mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	150W 80Plus ATX

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	128x32 Graphical LCD Module
LED	Power/ HDD/ Ethernet/Bypass
USB	Dual USB 2.0
VGA	N/A
LOM	N/A



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

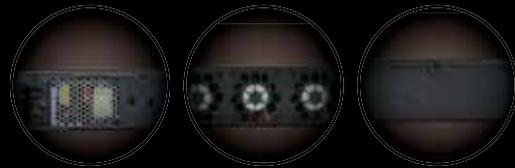
## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
CAR-2051 (C2758)	8/8	2.4GHz	4M	20W
CAR-0251 (C2558)	4/4	2.4GHz	2M	15W

# CAR-2040

Intel® Haswell Platform, Maximum support up to 4 GbE Ports

The CAR-2040 is built with Intel® Core™ Haswell Processors and Lynx Point H81 chipset, designed to optimize the power savings and have high performance. Support for SATA 3.0, dual USB ports, and dual channel DDR3-1600 memory with up to 16GB. The CASwell CAR-2040 is the lowest cost of 1U platform but optimization system.



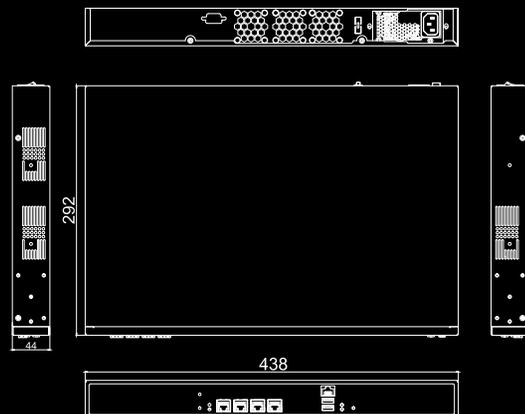
x86-1U Architecture

## Feature

- Intel® 4<sup>th</sup> Generation Core™ Processors
- Two DIMMs DDR3 up to 16GB
- 4 GbE ports
- One 3.5" or one 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® Haswell
PCH/Chipset	Intel® H81 PCH
System Memory	2 DDR3 Long DIMMs, up to 16GB
Ethernet Port	Up to 4 GbE RJ45
Bypass	N/A
Expansion	N/A
Storage Device	1x 3.5" or 1x 2.5" SATA HDD CFEX Socket
Dimension	438(W) x 292.1(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	150W Single ATX



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	N/A

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
i7-4770S (Project Base)	4C/8T	3.1	8M	65W
i5-4570S	4C/4T	2.9	6M	65W
i3-4330	2C/4T	3.5	4M	54W
Pentium G3420	2C/2T	3.2	3M	54W
Celeron G1820	2C/2T	2.7	2M	54W

# CAR-2030

Intel® Sugar bay platform. Sandy Bridge, Ivy Bridge & H61

x86-1U Architecture

CASwell CAR-2030 are used in a wide range of applications with widely differing needs. Meeting the diverse demands of these applications requires the flexibility and software support of a mainstream architecture that enables developers to focus on value-add applications rather than re-designing commodity functions.



## Feature

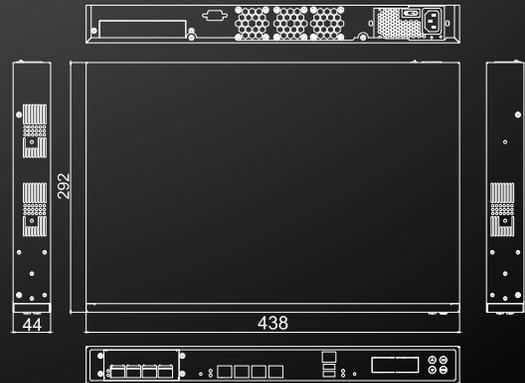
- Intel® LGA1155 Sandy Bridge(32nm) & Ivy Bridge(22nm) CPU
- Two DIMMs DDR3 1333 up to 16GB
- 4 GbE ports
- One 3.5" or two 2.5" internal SATA HDD

## SPECIFICATION

CPU Board	Intel® LGA1155
PCH/Chipset	Intel® H61 PCH
System Memory	2 DDR3 Long-DIMMs, up to 16GB
Ethernet Port	Up to 4 GbE RJ45
Bypass	N/A
Expansion	N/A
Storage Device	1x 3.5" or 2x 2.5" SATA HDDs CF Socket
Dimension	438(W) x 292(D) x 44(H)mm 17.24"(W) x 11.5"(D) x 1.73"(H)
Power	250W 80Plus ATX

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	N/A



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
G850	2/2	2.90 GHz	3M	65 W
G540	2/2	2.50 GHz	2M	65 W
i3-3220	2/4	3.30 GHz	3M	55W
G2120	2/2	3.10 GHz	3M	55W

# CAF-2000

The CASwell Fanless Desktop Network Appliance by Intel® Haswell mobile Processor

CAF-2000, the all new fanless network platform from CASwell. Built with Intel® Haswell ULT (SoC), it has high performance but low power consumptions and has the advantage of low noise. Support 3G and Wifi wireless module to support the new application of wireless gateway. CAF-2000 is ideal solution of UTM/ IPS/ IDS/ VPN/ VoIP and so on.



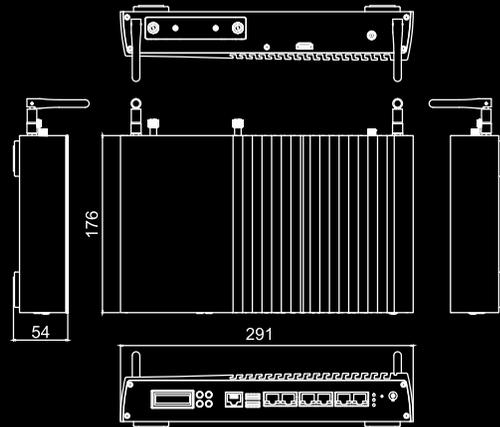
x86-1U Architecture

## Feature

- Intel® Haswell Mobile Processor Product Family
- 1 DDR3 Low voltage SO-DIMMs, up to 16GB
- 6 RJ45/SFP
- 1x 2.5" Internal SSD

## SPECIFICATION

CPU Board	Intel® Haswell Mobile ULT SoC
PCH/Chipset	N/A
System Memory	1 DDR3L SO-DIMM, up to 8 GB
Ethernet Port	6 GbE RJ45
Bypass	1 Segment
Expansion	N/A
Storage Device	1x 2.5" SATA SSD CFEX socket
Dimension	280(W) x 175(D) x 43(H)mm 11.02"(W) x 6.89"(D) x 1.69"(H)
Power	60 W 12 V Adapter



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	2x16 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet/Bypass
USB	Dual USB 3.0
HDMI	HDMI connector
LOM	N/A

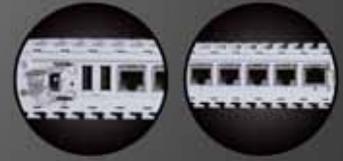
## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
I7-4650U	2C/4T	3.3	4M	15W
i5-4300U	2C/4T	2.9	3M	15W
I3-4010U	2C/4T	N/A	3M	15W
2980U	2C/2T	N/A	2M	15W

# CAF-1000

AMD G-series T24L processor and A50M chipset

CAF-1000 is the first AMD fanless solution by CASwell. Special chassis and fanless design can work firmly in critical temperature or no noise environment. Also, CAF-1000 has special heat sink design to extend the operating temperature limit when the added heat sink slides on. CAF-1000 is the ideal solution for UTM/ IPS/ IDS/ VPN/ VoIP and other terminal application with strict condition.



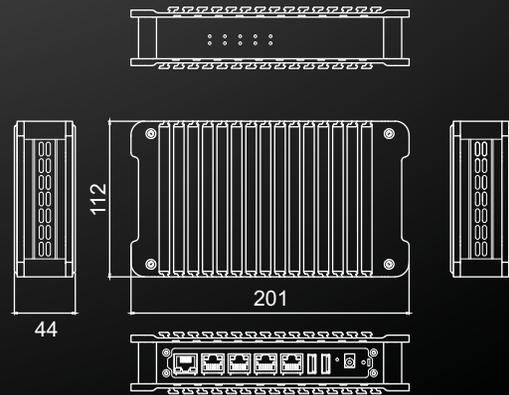
## Feature

- Support AMD G-series T24L processor and A50M chipset
- "T-type Aluminum-Extruded Track" chassis design
- Upgradable heatsink for working environment temperature up to 55°C
- Easy to combine together for arrangement and deployment
- Small form factor can be deployed in anywhere space is limited
- Provide wall mount solution



## SPECIFICATION

CPU Board	AMD T24L
PCH/Chipset	A50M Chipset
System Memory	1 SO-DIMM DDR3, up to 4GB
Ethernet Port	Up to 4 GbE RJ45
Bypass	N/A
Expansion	N/A
Storage Device	CF socket
Dimension	201(W) x 112(D) x 44(H)mm 7.91"(W) x 4.41"(D) x 1.73"(H)
Power	12V 24W DC Adapter



## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ Ethernet
USB	Dual USB 2.0
VGA	N/A
LOM	N/A

## OPERATION

Operating Environment	Temp: 5 to 35°C (41 to 104°F) 20 to 90%RH
Storage Environment	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH @55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

# CAD-0230

## Intel® Rangeley Atom™ Processor based Desktop Network Appliance

Targeting thermally constrained networking and communications systems, this system-on-chip (SoC) design extends 64-bit multi-core Intel® processors into thermal envelopes as low as 7 watts and integrated Intel® QuickAssist Technology provides up to 10 Gbps of cryptographic acceleration.



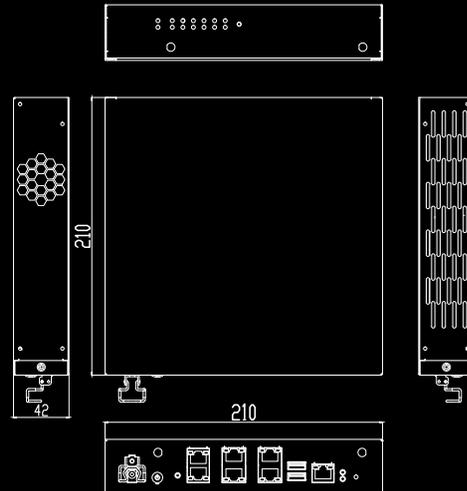
x86-DT Architecture

## Feature

- Intel® Rangeley Atom™ SoC Architectural Processor
- 4 Cores 2.4GHz SoC Processor with Intel QAT.
- 6x GbE Ports with 1 Segment CASwell Intelligent Bypass Function
- 2 DDR3/L SO-DIMMs. Max Memory Size: 16GB (base on memory spec)
- One Mini-PCIe Slot and PCIe1 Connector
- One 2.5" SATA HDD

### SPECIFICATION

CPU Board	Intel® Rangeley Atom™ Processor SOC
PCH/Chipset	N/A
System Memory	2 DDR3/L SO-DIMMs, up to 16GB
Ethernet Port	6 GbE RJ45
Bypass	1 Segment
Expansion	N/A
Storage Device	1x 2.5" SATA/SAS HDD CFEX Socket
Dimension	210(W) x 210(D) x 42(H)mm 8.27"(W) x 8.27"(D) x 1.65"(H)
Power	40W 12V DC adapter



### FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ HDD/ Ethernet/Bypass
USB	Dual USB 2.0
VGA	N/A
LOM	N/A

### OPERATION

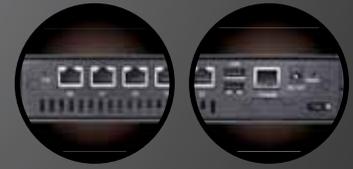
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Windows, Linux Kernel

# CAD-0225

New Desktop Communication Appliance Based on Intel® Bay-Trail Platform

x86-DT Architecture

The CAD-0225 built with Intel® Celeron® Processor J1900, supports best computing performance and lower power consumption. True low power SoC, single package solution with small chassis not only cost effective but also all-powerful in any applications, it can fulfill your entry level desktop solution with most of requirements.



## Feature

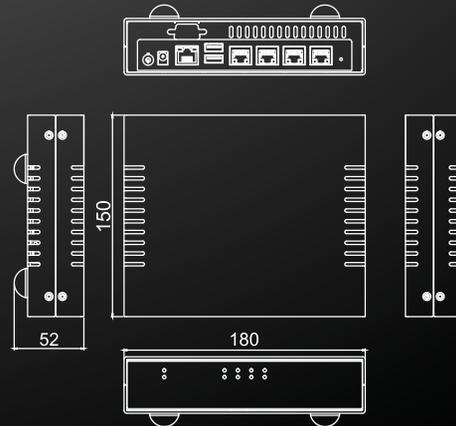
- Intel® Bay Trail-D (Intel® Celeron® Processor)
- 4 PCIe x1 from CPU directly use Intel® i211-AT
- Support 1 DDR3L-1333 low voltage memory

## SPECIFICATION

CPU Board	Intel® J1900
PCH/Chipset	N/A
System Memory	1 DDR3L SO-DIMMs, up to 8GB
Ethernet Port	4GbE RJ45
Bypass	N/A
Expansion	N/A
Storage Device	1x 2.5" SATA HDD
Dimension	180(W) x 145(D) x 44(H)mm 11.81"(W) x 5.71"(D) x 1.73"(H)
Power	40W 12V DC Adapter

## FRONT PANEL

Serial Port	RJ45 Console
LCD Panel	N/A
LED	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	2x5 pin-header
LOM	N/A



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

# CAD-0220/0221

AMD G-series T24L/T16R processor and A50M chipset

This entry level desktop solution by CASwell called CAD-0220/1 has six RJ45 with 1 segment bypass function. AMD 1 GHz single or dual core CPU support virtualization and extremely low power consumption. Adapted with 8GB DDR3 1066 So-DIMM memory and VGA output. It's the ideally cost effective option for UTM/ IPS/ IDS/ VPN and VoIP solution.

x86-DT Architecture

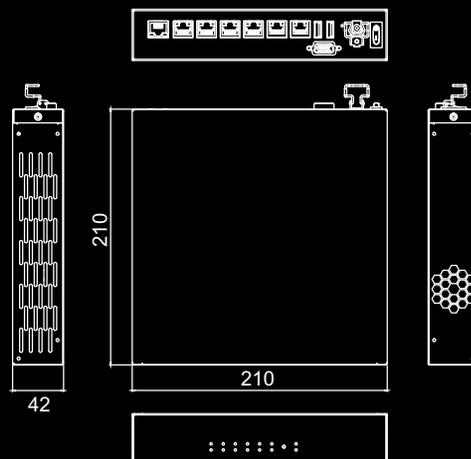


## Feature

- AMD G-series T24L and T16R with A50M
- Support Multi Core CPU(Project Base)
- New AMD X86 architecture
- Support 6 Gigabit Ethernet ports
- Support Generation 3 Bypass
- System totally consumes around 25 watts
- Support one 2.5"HDD and one compact flash slot

## SPECIFICATION

CPU Board	AMD T48E/T56E
PCH/Chipset	A50M Chipset
System Memory	1 DDR3 SO-DIMM, up to 4GB
Ethernet Port	Up to 6 GbE RJ45
Bypass	1 Segmen
Expansion	N/A
Storage Device	1x 2.5" SATA HDD CF Socket
Dimension	210(W) x 210(D) x 42(H)mm 8.27"(W) x 8.27"(D) x 1.65"(H)
Power	40W 12V DC Adapter



## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	2x5 pin-header (CAD-0221)
LOM	N/A

## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH@ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

# CAD-0215

AMD G-series T24L processor and A50M chipset

x86-DT Architecture

The CAD-0225 built with Intel® Celeron® Processor J1900, supports best computing performance and lower power consumption. True low power SoC, single package solution with small chassis not only cost effective but also all-powerful in any applications, it can fulfill your entry level desktop solution with most of requirements.



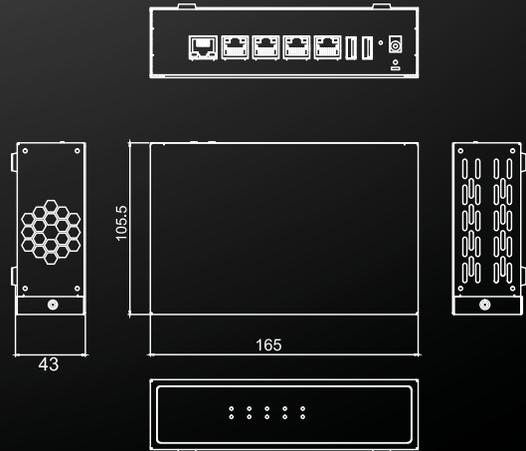
## Feature

- AMD G-series T24L 1 GHz and A50M
- Chipset TDP: 11 watts
- New AMD X86 architecture
- Support 4 Gigabit Ethernet port
- System totally consumes around 21 watts
- Support One 2.5" HDD (Project base) and One compact flash slot
- Provided USB signals
- Smaller than Half A4 paper size



## SPECIFICATION

CPU Board	AMD T24L
PCH/Chipset	A50M Chipset
System Memory	1 DDR3 SO-DIMM, up to 4GB
Ethernet Port	Up to 4 GbE RJ45
Bypass	N/A
Expansion	N/A
Storage Device	CF Socket
Dimension	165(W) x 105.5(D) x 43(H)mm 6.5"(W) x 4.15"(D) x 1.69"(H)
Power	24W 12V DC Adapter



## FRONT PANEL

Serial Port	RJ45 system console
LCD Panel	N/A
LED	Power/ Ethernet
USB	Dual USB 2.0
VGA	N/A
LOM	N/A

## OPERATION

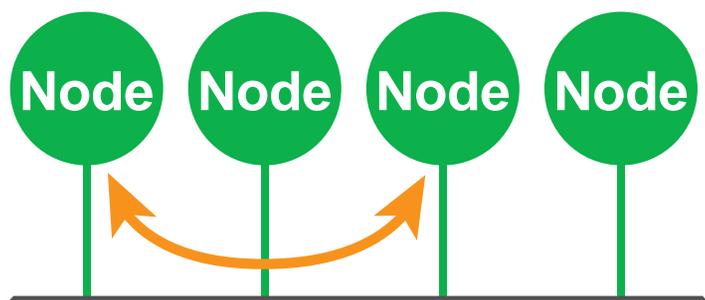
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH@ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

# Tilera – The Many Core Solution *Tilera Series Products*

CASwellTileraseries products provide complete many-core solution thatbrilliantly deliver and enablehigh-performance, energy-efficiencyand flexibilityin network security, multimediastreaming and cloud computing applications.

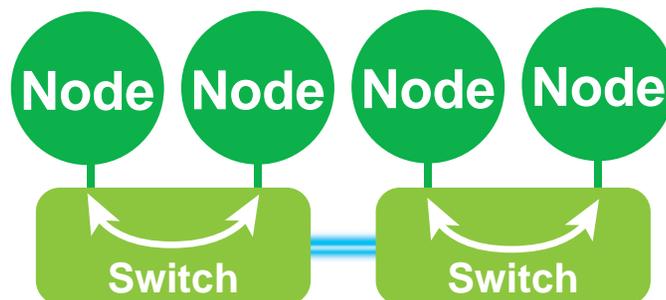
As data and services migrate from traditional applications to the cloud and mobile applications, itrequire more bandwidth.Designers of equipment for next-generation network infrastructure are required to achieve increased network performance despite demanding power consumption constraints. The computing demand of intelligent networking and security applications are also increasing dramatically, driven by increasing bandwidth requirements, services from the periphery of enterprises into the core of the network, and increasing sophistication and deployment of security and services functions. To meet these challenges, networking equipment must provide best-in-class energy efficiency (performance per Watt) using a hardware and software architecture that can scale to support growth in user traffic. Currently, the performance delivered by traditional processors and dedicated processors has not kept up with the increasing computing demand.

Interconnectionnetworks can be classified into shared-medium networks or switched-medium networks. A shared-medium network transfers data on a network medium (i.e., link) shared by allconnected nodes. Shared bus network falls into this category. On the otherhand, a switch-medium network consists of switch fabrics (routers) and point-to-point links. A routerhas several input ports and output ports, and it dynamically establishes a connection between a setof an input port and an output port. A switch-medium network can be formed by connecting routersusing point-to-point links.A typical example of on-chip shared-medium network is an on-chip bus that connects IP coresvia a shared wire link on a single chip. On-chip buses have been widely used as traditional on-chipinterconnects. Benefits of buses are efficiency in transferring short packets such as signals,and various techniques to improve the performance of on-chip buses have been studied.Contrary, buses are considered to be inadequate to handle large communication bandwidth demandswhen they connect a large number of IP cores, and also inefficient in terms of area.



Network media is shared by all nodes

**Figure 2.1**  
Shared-medium network



Point-to-point network link

**Figure 2.2**  
Shared-medium network

# Tilera – The Many Core Solution *Tilera Series Products*

CASwell TILE-Gx family products feature with 9, 16, 36, and 72 identical processor cores (tiles) interconnected with Tilera's iMesh on-chip network. Each core consists of a full-featured 64-bit processor core as well as L1 and L2 cache and a non-blocking mesh which connects the core into the Tilera Intelligent mesh (iMesh). Up to 23 MBytes of coherent cache is available and the high-end TILE-Gx devices can address up to 1 TB of DDR3 memory. The highly-scalable Tile architecture provides a broad range of performance and price-points to meet the customers' requirements - all with an open source and easy to program software environment. All TILE-Gx products are software compatible, customers can easily integrate their application software and scale corresponding performance levels by leveraging these processing cores.

## High Performance PCI Express Technology

The bandwidth for Ethernet is the pervasive communications technology having migrated from 1Gbps, 10Gbps to 40Gbps and now moving to 100Gbps. Modern servers and processors are spending more time processing packets flowing from Ethernet ports to the PCI interface than any other task. The Network Interface Card (NIC) is the logical bridge from the network world (Ethernet) to compute (PCIe). While modern server design including processing, memory and I/O are interconnected with data, address and control buses. Current computing architecture is designed for local memory workloads in which the processor mostly crunches algorithms, while the I/O throughput is secondary and dimensioned for peripherals. The PCIe interface, quickly established itself as the lead I/O interface, creating massive industry backing for it.

## Power-efficient Design

CASwell intelligent NIP module has faster and low-power processors to handle all the vast amounts of data. The massive compute of the Tilera TILE-Gx family processor is complimented with 40 Gbps of Ethernet I/O to enable both of network endpoint or "bump in the wire" configurations. Such powerful and high-efficient processor consumes only up to 25W. Hence it has the optimized PUE (Power Usage Efficiency) and is the best choice for network and cloud applications.

## Flexible Modular Design

CASwell's flexible modularity design can help customers easily deploy their products development and integration. As shown in Figure 1, modular design offers several different configurations of network interfaces, which provides the benefits of scalability and flexibility. All of these parts can be easily interchangeable and replaceable depend on customers' requirement.

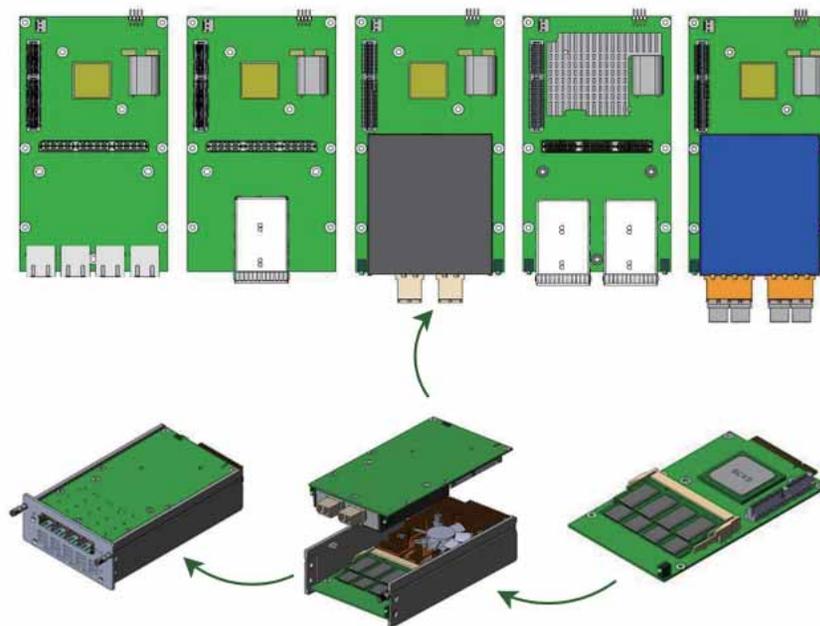


Figure 1 Flexible modular design in Tilera NIP modules.

Figure 2 shows the conceptual framework of heterogeneous communication model between X86 host and Tilera compute module in which X86 host platform can be seamlessly integrate with Tilera compute module. As can be seen, packets received from the network link are forwarded to the x86 host. The X86 host can take corresponding process and loopback packets to Tilera module over the PCIe communication channel by leveraging packet queue and DMA technologies. Depending customers' host applications, appropriatedriver implementation can be chosen to maximize performance. CASwell TILE-Gx products enable true application offloading capability by the unique combination of high throughput compute, low power consumption, and a standard C/Linux based programming model. CASwell TILE-Gx based products satisfy all of our customers' differing needs with a complete and scalable solution.

# Tilera – The Many Core Solution *Tilera Series Products*

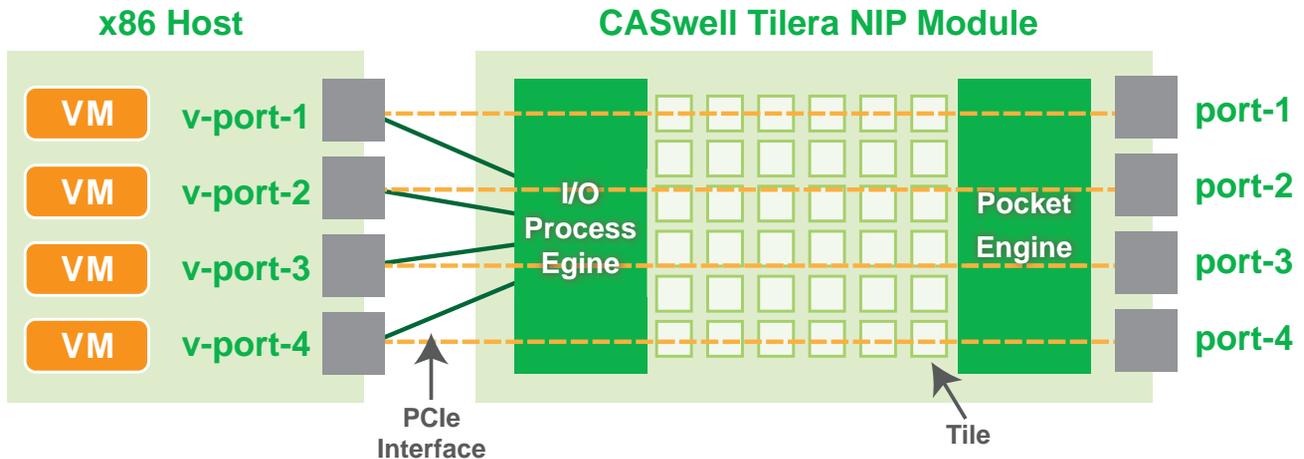


Figure 2 Conceptual framework of X86 host and Tilera compute module.

CASwell Tilera series products deliver flexible software infrastructure that allows customers to connect different applications together to form the needed applications. The following applications are available and can be running seamlessly and scaling across different processor cores:

- Software-Defined NIC – Complete infrastructure framework for a highly agile and programmable N x 10G NIC function, with extensions for 40G and 100G, supporting Intel DPDK drivers, SR-IOV and virtualized servers
- Open vSwitch – L4 open source user-space implementation at speeds up to 40Gbps, tightly coupled with SR-IOV, designed to support SDN and NFV server adapters
- Deep Packet Inspection (DPI) – Real-time, Layer 2-7 classification of network application traffic at up to 50Gbps on a single TILE-Gx processor
- Security Protocol Offload – Complete IPsec and SSL datapath and handshake offload at 40Gbps
- Intrusion Detection/Prevention – Highest performance Suricata multi-threaded IDS/IPS, fully integrated on TILE-Gx with support for the 'Emerging Threats' rule base
- Network Analytics – Wire-speed capture of packets to host processor or to disc with precision time-stamping, and with optional programmable flow filtering at up to 80Gbps
- TCP/IP Stack – High performance user-space TCP/IP implementation scales linearly with number of cores. 80Gbps throughput and 1.3M connections/second using a fraction of cores

## All is Just Beginning

CASwell fields as your best partner to complete your solution. We design and customize all network appliances you need not only in hardware design but also in software-related services.

# Reference Table



MODEL	CAT-8000	CAT-5038	CAT-5030	CAT-4020
CPU Board	Intel® Sandy Bridge-EP	Intel® Sandy Bridge-EP Intel® Cave Creek PCH	Intel® Sandy Bridge-EP Patsburg-B PCH	Intel® 4 <sup>th</sup> Generation Haswell Core™ Processor Intel® PCH C226
System Memory	16 DDR3 ECC Long-DIMMs, up to 128GB	16 DDR3 ECC Long-DIMMs, up to 128 GB	16 DDR3 ECC Long-DIMM, up to 128GB	2 DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 50 GbE RJ45/SFP	Up to 46 GbE RJ45/SFP	Up to 24 GbE RJ45/SFP	Up to 50 GbE RJ45/SFP
Bypass	Based on CASwell NIC Module or Standard add-on card	Based on CASwell NIC Module or Standard add-on card	Based on CASwell NIC Module or Standard add-on card	Based on CASwell NIC Module or Standard add-on card
Expansion	Up to 5 PCIe x8 Gen2 for CASwell NIC Module Up to 4 PCIe x4/ x8 Gen. 3 Standard add-on card	Up to 3 PCIe x8 Gen2 for CASwell NIC Module Up to 4 PCIe x8 Gen. 3 Standard add-on card	Up to 3 PCIe x8 Gen2 for CASwell NIC Module 1 PCIe x4 and 1 PCIe x8 Gen. 2 Standard add-on card	2 PCIe Gen.2 for CASwell NIC Module
Storage Device	2x 3.5" Swappable SATA/SAS HDDs CFex Socket	2x 3.5" Swappable SATA/SAS HDDs CF Socket	2x 3.5" Swappable SATA HDDs CF Socket	2x 2.5" Swappable SATA/SAS HDDs CFex Socket
Serial Port	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header	RJ45 system console 2x5 pin-header	RJ45 System Console
LCD Panel	2x16 Characters 128x32/64 Graphic	2x16 Characters 128x32/64 Graphic	2x16 Characters 128x32/64 Graphic	16x2 Characters
LED	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet	Power/ HDD/ Ethernet
USB	Dual USB 2.0	Dual USB 2.0	Dual USB 2.0	Dual USB 3.0
VGA	Optional from LOM or VGA module	Optional from LOM module	Optional from LOM module	Optional from LOM or VGA module
LOM	IPMI 2.0 w/ GbE speed (Optional)	IPMI 2.0 w/ GbE speed (Optional)	IPMI 2.0 w/ GbE speed	IPMI 2.0 w/ GbE Speed (Optional)
Power	500W/ 600W 2U Mini Redundant	450W/ 600W 2U Mini Redundant	500W 2U Redundant	280W 1U Redundant
Dimension	446(W) x 626(D) x 89(H)mm 17.56"(W) x 24.65"(D) x 3.5"(H)	446(W) x 626(D) x 89(H)mm 17.56"(W) x 24.65"(D) x 3.5"(H)	444(W) x 562(D) x 88(H)mm 17.48"(W) x 22.13"(D) x 3.46"(H)	435(W) x 448(D) x 44(H)mm 17.13"(W) x 17.64"(D) x 1.73"(H)
Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH	Temp: 5 to 35°C (41 to 95°F) 20 to 90%RH	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: 0 to 70°C (32 to 158°F) 5 to 95%RH@ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL	CE/FCC/UL
OS Support	Linux Kernel	Linux Kernel	Linux Kernel	Linux Kernel
PAGE	51	52	53	54

# CASwell Tiler NIP Modules

*The Next-Generation Network Processing Unit (NPU) Modules Built with Tiler Many-core Processor*

Caswell Tiler module is the latest and one of the most powerful many-core solutions from CASwell. Leveraging the advantages of Tiler Gx-8036 processor, Caswell Tiler module owns both of the high computing power as well as the best performance-per-watt. 36 64-Bit computing cores running at 1.2 GHz are built equivalent in the compact silicon. Each core includes independent 32 KB of L1 I-cache, 32 KB of L1 D-Cache and 256 KB L2 cache, and with up to 32 megabytes L3 coherent cache across the device. Such powerful and high efficient processor consumes only up to 25W. Hence NIP-63xxx series has the optimized PUE (Power Usage Efficiency) and is the best choice for network and cloud applications.



With full utilization of MiCA (iMesh Crypto Accelerator) and mPIPE (multicore Programmable Intelligent Packet Engine) of TILE Gx-8036, Caswell Tiler module provides 40 Gbps encryption and 40 Gbps full-duplex compression processing ability and the breathtaking wire-speed classification for packet processing, load balancing and buffer management. And up to 40 Gbps, 60 million packets-per-second throughput for handling multiple layers of packet classification and encapsulation. Equipped with two 4 SFP+ with or without Bypass feature (optional), Caswell Tiler module is also suitable for network security applications.

## Big Muscle, Small Appetite: New Architecture with Mesh-linked Network Interconnection Many-Core CPUs for New Security & DPI Applications

The DPI engine implemented on TILE Gx-8036 features next-generation DPI technology and provides real-time layer 2-7 classification of network traffic. By adapting NIP-63xxx series, the quad port 10 GbE Ethernet interfaces integrate external network connections and provide variable application combinations.

Modular design makes the adoption of Caswell Tiler module flexible and light. It can be plugged into any of the NIP-slots in CASwell rack-mount appliances and connected itself with host system via proprietary PCIe interface.

## Key Features

- Comprehensive Tiler MiCA (Multicore iMesh acceleration) engine for crypto, compression, pattern matching, TCP-offloading, QoS etc.
- Best compression performance.
- Best security acceleration for IPsec / SSL encryption.
- 36 Core MIPS64 processor cores.
- Two DDR3 SO-DIMM memory up to 32GB
- Proprietary PCIe x8 interface for host connection.
- Pin out for USB and console for testing and debugging.

Hardware Specification	
<b>OS Support</b>	Linux 2.6 64-Bit (MDE 4.1.5)
<b>Processor</b>	TILE-Gx8036 1.2Ghz, 36 Cores
<b>Memory</b>	2 So-DIMM, up to 16GB.
<b>Flash</b>	Serial flash for boot loader
<b>Host PCI-Express Lanes</b>	Proprietary PCIe x8 Gen. 2
<b>Ethernet Port</b>	SFP+ (Selectable )
<b>Bypass</b>	CASwel Bypass module (Optional)
<b>Dimension (W x D x H)</b>	85(W) x 150(D) x 36(H) mm 3.35"(W) x 5.91"(D) x 1.42"(H)
<b>Operating Environment</b>	5 ~ 45 °C (41 to 113 °F) 20 ~ 90 % RH
<b>Storage Environment</b>	0 ~ 70 °C (32 to 158 °F) 5 ~ 95 % RH
<b>Cable connector</b>	SFP+ connectors
<b>Security</b>	IPsec & SSL
<b>IEEE standard</b>	Compliant with IEEE 802.3

## Ordering Guide

Model	Part Number	Descriptions
NIP-63040	ABA-5014	Gx-8036 Quad SFP+ ports module
NIP-63240	ABA-5017	Gx-8036 Quad SFP+ ports with bypass module

# CAT-8000

High Performance Tiler TILE-Gx36 Platform with Intel® Ivy Bridge Core™ i7 COM Express Module

Heterogeneous

CAT-8000 is one of brand new flagships in CASwell communication appliance fleet, which provides high computing power and best performance-per-watt, as well as maximized Ethernet bandwidth with flexible I/O configuration. With Tiler Gx-36 processor and one Intel Ivy Bridge processor based on COM (Computer on Module) express module, CAT-8000's intelligent heterogeneous computing architecture plays an optimized and easy-to-deploy solution for networking processing, multimedia and cloud applications.



## Feature

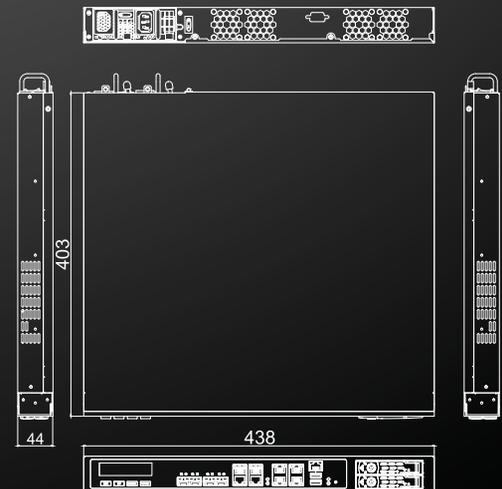
- Tiler TILE-Gx36 Processor
- Intel® Ivy Bridge Core™ i7 Processor
- 4 DIMMs 1600 DDR3. Max Memory Size: 32GB
- IPMI v2.0 Module with GbE Speed

### SPECIFICATION

CPU Board	Tiler TILE-Gx36 Processor
PCH/Chipset	N/A
System Memory	4 DDR3 ECC Long-DIMMs, up to 64GB
Ethernet Port	2 SFP+, 8 GbE RJ45
Bypass	5 Segments
Expansion	1 PCIe x8 Gen. 2 for Type VI COM Express Module
Storage Device	2x 2.5" Swappable SATA/SSD HDDs CFex Socket
Dimension	404 (W) x 438 (D) x 44 (H) mm 15.9" (W) x 17.24" (D) x 1.71" (H)
Power	220W 1U Redundant 300W 80Plus ATX

### FRONT PANEL

Serial Port	RJ45 System Console
LCD Panel	16x2 Characters
LED	Power/ HDD/ Ethernet/ Bypass
USB	Dual USB 2.0
VGA	N/A
LOM	IPMI 2.0 with GbE Speed (Optional)



### OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
TILE-Gx36 w/ crypto	36C	1.2	12M	35W
TILE-Gx36 w/o crypto	36C	1.2	12M	35W

# CAT-5038

Intel® Xeon® E5-2600 Series Platform with Tiler TILE-Gx36 Programmable Compute Module

Heterogeneous

The 2U CAT-5038 platform, incorporating with up to eight Tiler's TILE-Gx36 modules, delivers the utmost computing density together with massive I/O capability. The modular design of the platform allows a range of flexible configurations and easy updates for applications development and deployment. The CAT-5038 platform provides up to 320 Gbps of Ethernet I/O at the front panel. This rack-mountable device can cope with tremendous packet processing demand for today's demanding network applications in software defined network (SDN), Network functions virtualization (NFV) "Big Data" and high-speed networking.

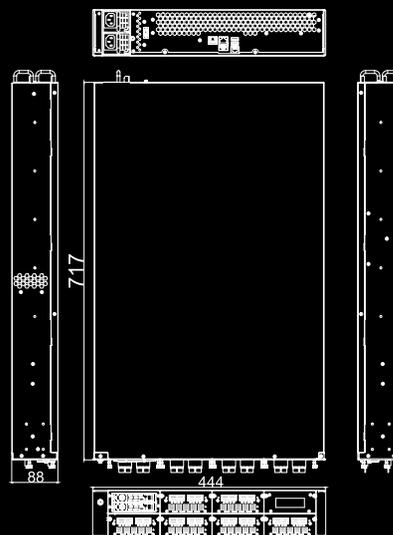


## Feature

- Dual Intel® Xeon® E5-2600 Series Processors
- Up to 16 cores, 40MB cache, 4 QPI links
- 16 DIMMs 1600 DDR3. Max Memory Size: 128GB
- Up to Eight PCIe x8 CASwell Proprietary NICs
- GbE speed IPMI v2.0 Module

## SPECIFICATION

CPU Board	Intel® Xeon® E5-2600 Series
PCH/Chipset	Intel® Patsburg-B PCH
System Memory	16 DDR3 ECC Long-DIMMs, up to 128GB
Ethernet Port	Based on CASwell NIC Module or Standard add-on card
Bypass	Based on CASwell NIC Module or Standard add-on card
Expansion	Up to 8 PCIe x8 Gen. 2 for CASwell NIC Module
Storage Device	2x 3.5" Swappable SATA/SAS HDDs CF Socket
Dimension	438(W) x 717(D) x 89(H)mm 17.2"(W) x 28.2"(D) x 3.5"(H)
Power	650W 2U Redundant



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 System Console
LCD Panel	16x2 Characters
LED	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	Optional from LOM or VGA module
LOM	IPMI 2.0 with GbE speed (Optional)

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E5-2648L	8C/16T	1.8	20	70W
E5-2658	8C/16T	2.1	20	95W
E5-2630	8C/16T	2.3	15	95W

# CAT-5030

Intel® Romley-EP Platform with Tiler TILE-Gx36 High Performance Programmable Compute Module

Heterogeneous

The 2U CAT-5030 platform, featuring with dual Intel® Xeon® processors and Tiler's TILE-Gx manycore module, delivers the utmost computing density together with massive I/O capability. The modular design of the platform allows a range of configurations and easy updates. The rack-mountable device can cope with tremendous packet processing demand for today's demanding network applications in software defined network (SDN), "Big Data" and high-speed networking.

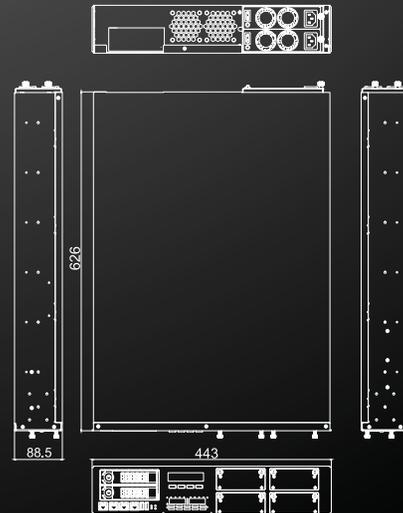


## Feature

- Dual Intel® Sandy Bridge-EP Socket R Type Processor
- Up to 16 Cores, 40MB cache, 4 QPI links
- 16 DIMMs 1600 DDR3. Max Memory Size: 128GB (Base on Memory Spec)
- Tiler TILE-Gx36 40Gbps Compute Module
- Expansion up to three standard PCIe8 and one PCIe4 add-on card (project base)
- GbE speed IPMI v2.0 module

## SPECIFICATION

CPU Board	Intel® Sandy Bridge-EP
PCH/Chipset	Intel® Patsburg-B PCH
System Memory	16 DDR3 ECC Long-DIMMs, up to 128GB
Ethernet Port	4 SFP+ for Tiler TILE-Gx36 NIP Module Based on CASwell NIC Module or Standard Add-on Card
Bypass	Based on CASwell NIC Module or Standard Add-on Card
Expansion	TILE-Gx36 40Gbps Compute Module Based on CASwell NIC Module or Standard Add-on Card
Storage Device	2x 3.5" Swappable SATA/SAS HDDs CF Socket
Dimension	446(W) x 626(D) x 89(H)mm 17.56"(W) x 24.65"(D) x 3.5"(H)
Power	500W/ 600W 2U Redundant PSU



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 System Console 2x5 pin-header
LCD Panel	16x2 Characters 128x32/64 Graphic
LED	Power/ HDD/ Ethernet
USB	Dual USB 2.0
VGA	Optional from LOM or VGA module
LOM	IPMI 2.0 w/ GbE Speed (Optional)
Ethernet	4x 10GbE SFP+ for Tiler TILE-Gx36 NIP Module

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E5-2648L	8C/16T	1.8	20	70W
E5-2658	8C/16T	2.1	20	95W
E5-2630	8C/16T	2.3	15	95W

# CAT-4020

Intel® 4<sup>th</sup> Generation Haswell Platform with Tiler TILE-Gx36 Programmable Compute Module

CAT-4020 1U high performance appliance can be configured with 4<sup>th</sup> generation Intel® Haswell processors and Tiler's TILE-Gx36 module to create cost-effective platforms for specific enterprise networking applications. The platform supports quad channel un-buffered ECC or non-ECC DDR3 1600 / 1333 MHz DIMM sockets with up to 32GB capacity, up to 4 removable 2.5" SATA HDD or SSD and 2 removable NIP modules. CAT-4020 is targeted at both of CPU-intensive and I/O applications such as high-end deep packet inspection (DPI) based solutions and applications with large I/O bandwidth requirements such as networking processing, multimedia and cloud applications.



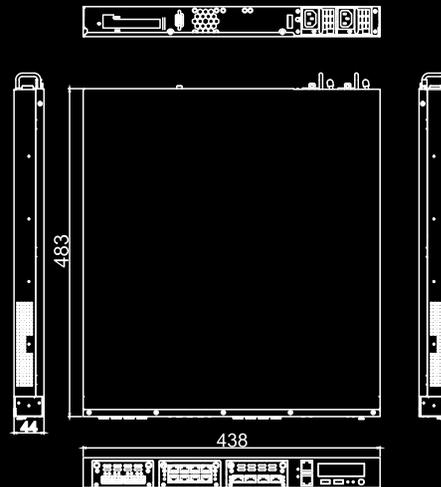
MIPS Architecture

## Feature

- Intel® 4<sup>th</sup> Generation Haswell Core™ Processor
- Dual Channel DDR3 1333/1066 MHz ECC DIMMs
- Max Memory Size: 32GB
- 2 x PCIe Gen.2 x8 CASwell NIP Slots
- GbE Speed IPMI v2.0 Module

## SPECIFICATION

CPU Board	Intel® 4 <sup>th</sup> Generation Haswell Core™ Processor
PCH/Chipset	Intel® C226 PCH
System Memory	2DDR3 ECC Long-DIMMs, up to 32GB
Ethernet Port	Up to 50 GbE RJ45/SFP
Bypass	Based on CASwell NIC Module or Standard add-on card
Expansion	2 PCIe Gen. 2 CASwell NIP Slots
Storage Device	2x 2.5" Swappable SATA/SAS HDDs CFex Socket
Dimension	435 (W) x 448 (D) x 44 (H) mm 17.13"(W) x 17.64"(D) x 1.73"(H)
Power	280W 1U Redundant PSU



## OPERATION

Operating Environment	Temp: 0 to 40°C (32 to 104°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Certification	CE/FCC/UL
OS Support	Linux Kernel

## FRONT PANEL

Serial Port	RJ45 System Console
LCD Panel	16x2 Characters
LED	Power/ HDD/ Ethernet
USB	Dual USB 3.0
VGA	Optional from LOM or VGA module
LOM	IPMI 2.0 with GbE Speed (Optional)

## Optional CPUs

Model	Cores/Threads	Frequency	Cache	TDP
E3-1275 v3	4C/8T	3.5	8M	95W
E3-1225 v3	4C/4T	3.2	8M	95W
E3-1268 v3	4C/8T	2.3	8M	45W
i3-4330	2C/4T	3.5	3M	54W
Pentium G3420	2C/2T	3.2	3M	54W

# Reference Table

Fiber NIP



MODEL	NIP-86020	NIP-53240	NIP-53040	NIP-52240	NIP-55140
Form Factor	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module
LAN Controller	Mellanox ConnectX-R	Intel® 82599ES	Intel® 82599ES	Intel® 82580EB	Intel® 82580EB
Ethernet Port	Dual Fiber QSFP+ Ethernet ports	4 SFP+	4 SFP+	2SFP	2 GbE RJ45, 2 SFP
Interconnect	N/A	10GBASE-SR	Depends on Transceiver	1000BASE-SX	Depends on Transceiver
Bus Type	Proprietary PCIe x8 Gen. 3	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x4 Gen. 2
Bypass	N/A	2 Segment	N/A	2 Segments	1 Segment
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 149.1(D) x 15.5(H)mm 3.35''(W) x 5.87''(D) x 0.61''(H)	85(W) x 163(D) x 32(H)mm 3.35''(W) x 6.42''(D) x 1.26''(H)	85(W) x 145(D) x 17(H)mm 3.35''(W) x 5.71''(D) x 0.67''(H)	85(W) x 162.1(D) x 17.1(H)mm 3.35''(W) x 6.38''(D) x 0.67''(H)	85(W) x 145(D) x 11(H)mm 3.35''(W) x 5.71''(D) x 0.43''(H)
PAGE	58	58	58	58	59

Fiber NIP



MODEL	NIP-53120	NIP-53020	NIP-52120	NIP-52080	NIP-52040
Form Factor	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module
LAN Controller	Intel® 82599ES	Intel® 82599ES	Intel® 82580DB	Intel® 82580EB	Intel® 82580EB
Ethernet Port	2 SFP+	2 SFP+	2 SFP	8 SFP	4 SFP
Interconnect	10GBASE-SR	Depends on transceiver	1000BASE-SX	Depends on transceiver	Depends on transceiver
Bus Type	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x4 Gen. 2	Proprietary Two PCIe x4 Gen. 2	Proprietary PCIe x4 Gen. 2
Bypass	1 Segment	N/A	1 Segment	N/A	N/A
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 160.7(D) x 18(H)mm 3.35''(W) x 6.33''(D) x 0.71''(H)	85(W) x 152(D) x 13.8(H)mm 3.35''(W) x 5.98''(D) x 0.54''(H)	85(W) x 160.7(D) x 18(H)mm 3.35''(W) x 6.33''(D) x 0.71''(H)	85(W) x 152(D) x 27(H)mm 3.35''(W) x 5.98''(D) x 1.06''(H)	85(W) x 152(D) x 11.7(H)mm 3.35''(W) x 5.98''(D) x 0.71''(H)
PAGE	59	59	59	60	60

# Reference Table



## Copper NIP

MODEL	NIP-52020	NIP-54021/121	NIP-51481	NIP-51240	NIP-51080	NIP-51040
Form Factor	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module
LAN Controller	Intel® 82580DB	Intel® X540-BT2	Intel® Powerville I350	Intel® 82580EB	Intel® 82580EB	Intel® 82580EB
Ethernet Port	2 SFP	2 10GBASE-T	8 GbE RJ45	4 GbE RJ45	8 GbE RJ45	4 GbE RJ45
Interconnect	Depends on transceiver	N/A	N/A	N/A	N/A	N/A
Bus Type	Proprietary PCIe x4 Gen. 2	Proprietary PCIe x8 Gen. 2	Proprietary 2 PCIe x4 Gen. 2	Proprietary PCIe x4 Gen2	Proprietary 2 PCIe x4 Gen. 2	Proprietary PCIe x4 Gen. 2
Bypass	N/A	1 Segments(NIP-54121)	4 Segments	2 Segments	N/A	N/A
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 145(D) x 17(H)mm 3.35''(W) x 5.71''(D) x 0.67''(H)	85(W) x 149.1(D) x 15.5(H)mm 3.35''(W) x 5.87''(D) x 0.61''(H)	85(W) x 145(D) x 29(H)mm 3.35''(W) x 5.71''(D) x 1.14''(H)	85(W) x 149(D) x 15(H)mm 3.35''(W) x 5.87''(D) x 0.59''(H)	85(W) x 149.8(D) x 27(H)mm 3.35''(W) x 5.9''(D) x 1.06''(H)	85(W) x 149.8(D) x 27(H)mm 3.35''(W) x 5.9''(D) x 1.06''(H)
PAGE	60	60	61	61	61	61

## Standard NIC



MODEL	NIC-71040
Form Factor	CASwell Standard network adapter
OS Support	Linux 2.4, 2.6 , FreeBSD, Windows
LAN Controller	Intel® i210AT
Ethernet Port	Quad Copper 1GbE Ethernet ports
Bus Type	PCIe x4 Gen. 2, Operable in x4,8,16 Slots
Bypass	N/A
PoE Capability	Power over Ethernet, IEEE 802.3af compliant
Power Consumption	Max : 65 Watts
Compliance	IEEE 802.3az Energy Efficient Ethernet IEEE 1588 Precision Clock Synchronization Audio-Video Bridging (AVB) Support (802.1Qav)
Miscellaneous	full-height bracket
Software programmable	PoE ON/OFF
Operating Environment	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C
Dimension	107(W) x 168(D) x 15(H)mm 4.21''(W) x 6.6''(D) x 0.59''(H)
PAGE	62



MODEL	BPC-54120	BPC-53120
Form Factor	CASwell Standard network adapter	Low-profile, Half-length PCIe network adapter
OS Support	N/A	Linux 2.4, 2.6 , FreeBSD, Windows
LAN Controller	Intel® 82599ES	Intel® X540
Ethernet Port	Dual 10G SFP+, SR Transceiver Cable type MMF 62.5/50 μm, up to 300 m	Dual Copper 10GbE Ethernet ports
Bus Type	PCIe x8 Gen. 2	PCIe x8 Gen2, Operable in x8,16 Slots
Bypass	1 Segment	1 Segment
PoE Capability	N/A	N/A
Power Consumption	N/A	N/A
H/W Selection	Selection of normal or bypass model when power on Built-in watchdog-timer bypass Ethernet ports when host system experiences hang or power failure.	Selection of normal or bypass model when power on Built-in watchdog-timer bypass Ethernet ports when host system experiences hang or power failure.
S/W Programmable	WDT time-out setting (software programmable from 1~255 seconds)	WDT time-out setting (software programmable from 1~255 seconds)
Operating Environment	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C
Dimension	100(W) x 168(D) x 17(H)mm 3.94''(W) x 6.6''(D) x 0.66''(H)	68.91(W) x 168(D) x 21.5(H)mm 2.713''(W) x 6.6''(D) x 0.85''(H)
PAGE	62	63

# Reference Table

## Standard NIC



MODEL	BPC-51243	BPC-51120	BPC-50120
Form Factor	Low-profile, Half-length PCIe network adapter	Low-profile, half-length PCIe network adapter	Low-profile, Half-length PCI network adapter
OS Support	Linux 2.4, 2.6 , FreeBSD, Windows	Linux 2.4, 2.6 , FreeBSD, Windows	Linux 2.4, 2.6 , FreeBSD, Windows
LAN Controller	Intel® i350AM4	Intel® i210AT	Intel® i210AT
Ethernet Port	Quad Copper 1GbE Ethernet ports	Dual Copper 1GbE Ethernet ports	Dual Copper 10/100 Ethernet ports
Bus Type	PCIe x4 Gen2, Operable in x4,8,16 Slots	PCIe x4 Gen. 2, Operable in x4,8,16 Slots	PCI Bus 133 MB/s (32-bit/33 MHz), Universal (3.3V & 5V)
Bypass	2 Segment	1 Segment	1 Segment
PoE Capability	N/A	N/A	N/A
Power Consumption	N/A	N/A	N/A
Compliance	SR-IOV Capable Virtual Machine Device Queues (VMDq) IEEE 802.3x and 802.3z flow control supported Hardware acceleration for TCP-IP and iSCSI	IEEE 802.3az Energy Efficient Ethernet IEEE 1588 Precision Clock Synchronization Audio-Video Bridging (AVB) Support (802.1Qav)	IEEE 802.3az Energy Efficient Ethernet IEEE 1588 Precision Clock Synchronization Audio-Video Bridging (AVB) Support (802.1Qav)
H/W Selection	Selection of normal or bypass model when power on Built-in watchdog-timer bypass Ethernet ports when host system experiences hang or power failure.	Selection of normal or bypass model when power on Built-in watchdog-timer bypass Ethernet ports when host system experiences hang or power failure.	Selection of normal or bypass model when power on Built-in watchdog-timer bypass Ethernet ports when host system experiences hang or power failure.
S/W Programmable	WDT time-out setting (software programmable from 1~255 seconds)	WDT time-out setting (software programmable from 1~255 seconds)	WDT time-out setting (software programmable from 1~255 seconds)
Operating Environment	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH	Temp: 0 to 55°C (32 to 131°F) 20 to 90%RH
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C
Dimension	64(W) x 168(D) x 14(H)mm 2.51'(W) x 6.6''(D) x 0.55''(H)	64(W) x 168(D) x 15(H)mm 2.51'(W) x 6.6''(D) x 0.59''(H)	64(W) x 168(D) x 15(H)mm 2.51'(W) x 6.6''(D) x 0.59''(H)
PAGE	63	64	64

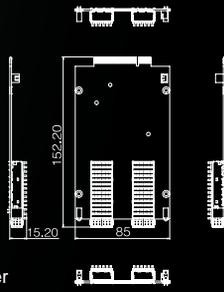
## Copper NIP



MODEL	NIP-71042	NIP-70001	NIP-70000	NIP-62041	NIP-61042	NIP-61041
Form Factor	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module	CASwell NIC Module
PHY controller	BroadCom	N/A	N/A	N/A	N/A	N/A
Chipset	Intel® Cave Creek	Cavium NITROX® PX CN1620	Cavium NITROX® PX CN1610-P	N/A	N/A	N/A
LAN Controller	N/A	N/A	N/A	Intel® 82580EB	Intel® 82580EB	Intel® 82580EB
Security Processor	N/A	N/A	N/A	N/A	N/A	Cavium NITROX® PX CN1620
Ethernet Port	4 GbE RJ45	N/A	N/A	4 SFP	4 GbE RJ45	4 GbE RJ45
Interconnect	N/A	N/A	N/A	N/A	N/A	N/A
Bus Type	Proprietary PCIe x8 Gen. 2	Proprietary PCIe x4 Gen. 2	Proprietary PCIe x4 Gen. 2	Proprietary Two PCIe x4 Gen. 2	Proprietary Two PCIe x4 Gen. 2	Proprietary Two PCIe x4 Gen. 2
Bypass	N/A	N/A	N/A	N/A	N/A	N/A
Storage Environment	Temp: -20 to 75°C (-4 to 167°F) 5 to 95%RH@55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C	Temp: -10 to 70°C (14 to 158°C) 5 to 95%RH @55°C
Dimension	85(W) x 145(D) x 20.2(H)mm 3.35''(W) x 5.71''(D) x 0.8''(H)	85(W) x 145(D) x 11.4(H)mm 3.35''(W) x 5.71''(D) x 0.45''(H)	85(W) x 145(D) x 29(H)mm 3.35''(W) x 5.71''(D) x 1.14''(H)	85(W) x 152(D) x 13.2(H)mm 3.35''(W) x 5.98''(D) x 0.52''(H)	85(W) x 148.9(D) x 18.35(H)mm 3.35''(W) x 5.86''(D) x 0.72''(H)	85(W) x 148.9(D) x 18.35(H)mm 3.35''(W) x 5.86''(D) x 0.72''(H)
PAGE	65	65	66	66	67	67

# NIP-86020

CASwell Network Fiber Module with Dual QSFP+ ports



## Feature

- IEEE 802.3ba 40 Gigabit Ethernet
- IEEE 802.3ad Link Aggregation and Failover
- Single Root IOV
- Multiple queues per virtual machine
- Enhanced QoS for vNICs
- RDMA over Converged Ethernet
- Ready for PCI-E Gen. 3 8GT/s solution

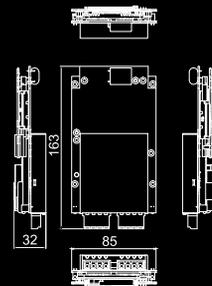


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Mellanox ConnectX-R
Ethernet Port	Dual Fiber QSFP+ Ethernet ports
Interconnect	Depends on transceiver
Bus Type	Proprietary PCIe x8 Gen. 3
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C
Dimension	85(W) x 152(D) x 15.2(H)mm 3.35"(W) x 5.98"(D) x 0.61"(H)

# NIP-53240

CASwell Network Module with 4 SFP+ and 2 Bypass function



## Feature

- Intel® 82599ES 10 Gigabit Ethernet Controller
- Fiber Switch Module with Quad SFP+
- Board-to-board high speed connection technology
- CASwell Intelligent Generation 3th Bypass function

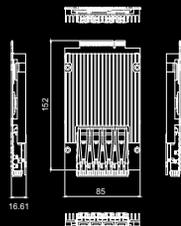
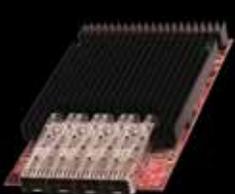


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82599ES
Ethernet Port	4 SFP+
Interconnect	10GBASE-SR
Bus Type	Proprietary PCIe x8 Gen. 2
Bypass	2 Segment
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 163(D) x 32(H)mm 3.35"(W) x 6.42"(D) x 1.26"(H)

# NIP-53040

CASwell Network Module with 82599ES, 4 SFP+



## Feature

- Intel® 82599ES LAN Controller
- 4 SFP+
- PCIe Switch Gen. 3

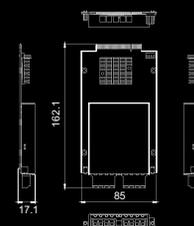


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82599ES
Ethernet Port	4 SFP+
Interconnect	Depends on Transceiver
Bus Type	Proprietary PCIe x8 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH@55°C
Dimension	85(W) x 145(D) x 17(H)mm 3.35"(W) x 5.71"(D) x 0.67"(H)

# NIP-52240

CASwell Network Module with 4 SFP & Bypass Function



## Feature

- Intel® 82580EB Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface
- Bypass Function with WatchDog Timer (WDT)
- Support Normal/Bypass/Open Modes
- Durable Fiber Bypass Module (FBM) Design

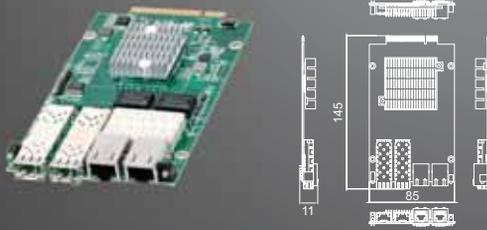


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580EB
Ethernet Port	2 SFP SR
Interconnect	1000BASE-SX
Bus Type	Proprietary PCIe x8 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 162.1(D) x 17.1(H)mm 3.35"(W) x 6.38"(D) x 0.67"(H)

# NIP-55140

CASwell Network Module with 2 GbE RJ45, 2 SFP with Bypass Function



## Feature

- Intel® 82580EB Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface
- Bypass Function with WatchDog Timer (WDT)
- Support Normal/Bypass/Open Modes

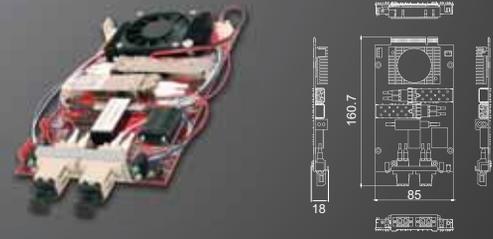


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580EB
Ethernet Port	2 GbE RJ45, 2 SFP
Interconnect	Depends on Transceiver
Bus Type	Proprietary PCIe x4 Gen. 2
Bypass	1 Segment
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 145(D) x 11(H)mm 3.35"(W) x 5.71"(D) x 0.43"(H)

# NIP-53120

CASwell Network Module with 2 SFP+ & Bypass Function



## Feature

- Intel® 82599ES 10 Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface
- Bypass Function with WatchDog Timer (WDT)
- Support Normal/Bypass/Open Modes

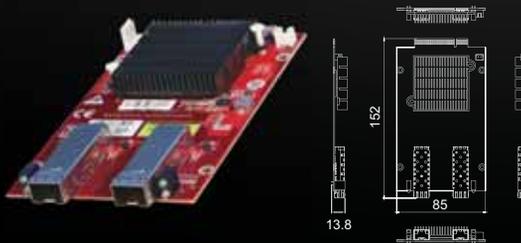


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82599ES
Ethernet Port	2 SFP+
Interconnect	10GBASE-SR
Bus Type	Proprietary PCIe x8 Gen. 2
Bypass	1 Segment
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 160.7(D) x 18(H)mm 3.35"(W) x 6.33"(D) x 0.71"(H)

# NIP-53020

CASwell Network Module with 2 SFP+



## Feature

- Intel® 82599ES 10 Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface

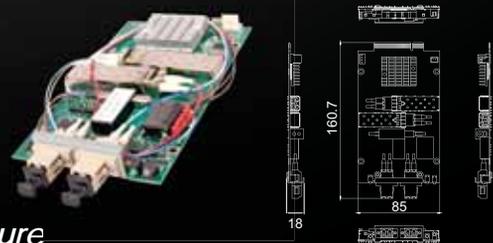


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82599ES
Ethernet Port	2 SFP+
Interconnect	Depends on Transceiver
Bus Type	Proprietary PCIe x8 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 152(D) x 13.8(H)mm 3.35"(W) x 5.98"(D) x 0.45"(H)

# NIP-52120

CASwell Network Module with 2 SFP & Bypass Function



## Feature

- Intel® 82580DB Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface
- Bypass Function with WatchDog Timer (WDT)
- Support Normal/Bypass/Open Modes

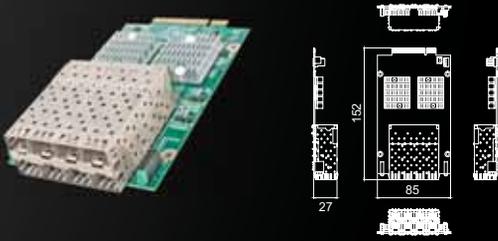


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580DB
Ethernet Port	2 SFP
Interconnect	1000BASE-SX
Bus Type	Proprietary PCIe x4 Gen. 2
Bypass	1 Segment
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 160.7(D) x 18(H)mm 3.35"(W) x 6.33"(D) x 0.71"(H)

# NIP-52080

CASwell Network Module with 8 SFP



## Feature

- Intel® 82580EB Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface

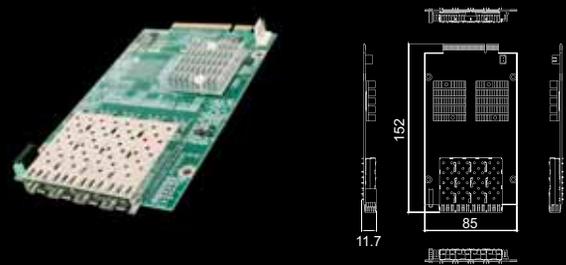


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580EB
Ethernet Port	8 SFP
Interconnect	Depends on Transceiver
Bus Type	Proprietary 2 PCIe x4 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 152(D) x 27(H)mm 3.35"(W) x 5.98"(D) x 1.06"(H)

# NIP-52040

CASwell Network Module with 4 SFP



## Feature

- Intel® 82580EB Gigabit Ethernet Controller
- PCIe V2.0 (5.0GT/s) Interface

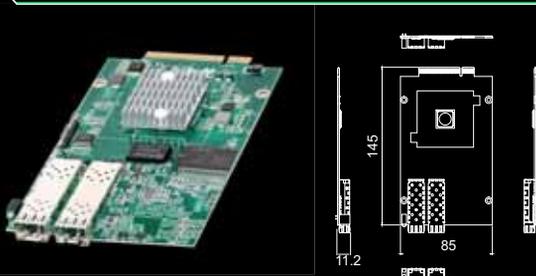


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580EB
Ethernet Port	4 SFP
Interconnect	Depends on Transceiver
Bus Type	Proprietary PCIe x4 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 152(D) x 11.7(H)mm 3.35"(W) x 5.98"(D) x 0.46"(H)

# NIP-52020

CASwell Network Module with 2 SFP



## Feature

- Intel® 82580DB LAN Controller
- 2 SFP
- PCIe X4 Gen. 2

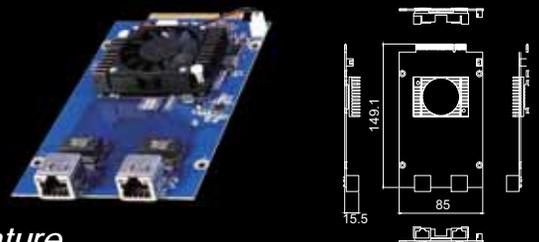


## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® 82580DB
Ethernet Port	2 SFP
Interconnect	Depends on Transceiver
Bus Type	Proprietary PCIe x4 Gen. 2
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @55°C
Dimension	85(W) x 145(D) x 17(H)mm 3.35"(W) x 5.71"(D) x 0.67"(H)

# NIP-54021/121

CASwell Network Module with 2 10GBASE-T



## Feature

- Intel® X540-BT2 10 Gigabit Ethernet Controller
- PCIe V2.1 (5.0GT/s) Interface
- 10GBASE-T Standard
- Provide 10Gbit/s Transmission with RJ45 Connectors



## SPECIFICATION

Form Factor	CASwell NIC Module
LAN Controller	Intel® X540-BT2
Ethernet Port	2 10GBASE-T
Bus Type	Proprietary PCIe x8 Gen. 2
Bypass	NIP-54121 only
Storage Environment	Temp: -10 to 70°C (14 to 158°F) 5 to 95%RH @ 55°C
Dimension	85(W) x 149.1(D) x 15.5(H)mm 3.35"(W) x 5.87"(D) x 0.61"(H)