



OPEN

Compute Project

RA-B6910-64C Hardware Specification

Revision 0.02

Baseline Template 2021

expected to be released on August 1, 2021.

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1. License

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2. OCP Tenets Compliance

The following content will describe how RA-B6910-64C addresses compliance with OCP Tenets in openness, efficiency and scale.

2.1. Openness

RA-B6910-64C is an open platform that is contributed under the OCP Contributor Licensing Agreement (OCP-CLA) by Ragile Networks Inc. There are no limitations of the OCP CLA license, any third party can build, modify, or personalize the device from open sourcing. The open sourcing is inclusive of all programmable devices, firmware, software, and all mechanical and electrical design elements. Any software necessary utilities or design platforms also are open source. Collaboration and willingness to share are what we have, we are willing to remove all of the barriers that prevents open platform.

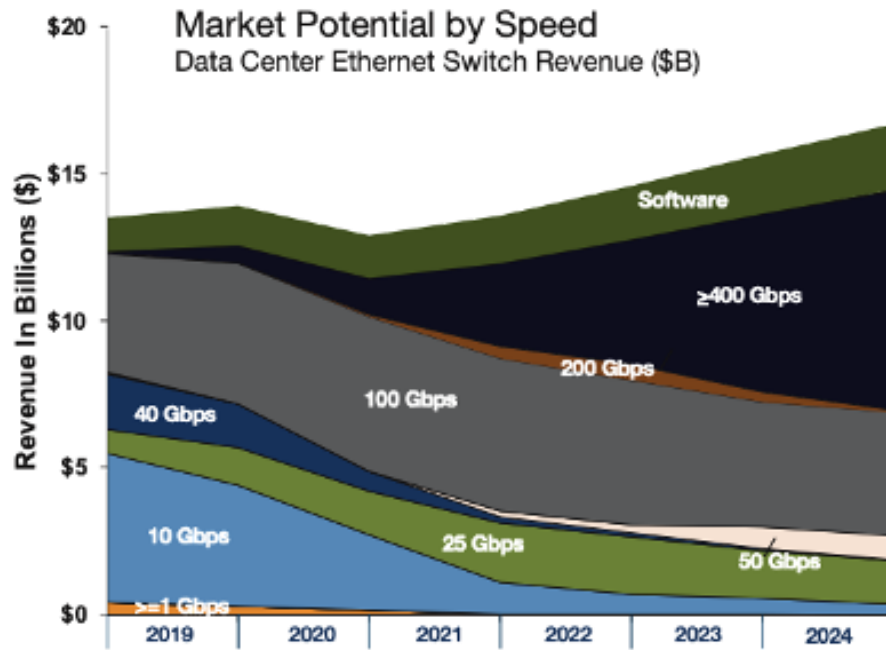
2.2. Efficiency

The Ragile RA-B6910-64C switch is a new generation high density 100GbE switch designed for cloud-scale datacenter and campus networks, which provide a powerful cache capacity and advanced scheduling mechanism driven large scale line-rate non-blocking network. With this device you can have less maintenance fee and lower power consumption. The port power is 12.3W/Port which is lesser than 32X100G product (about 14W/port).

2.3. Scale

Nowadays, with the fast grown of short video application and the west-east data flow, the Ethernet bandwidth is a critical thing that should be thought about. The popular combination in datacenter right now is 10G/40G that 10G port for Server-TOR and 40G for Spin-Leaf. In this case, 25G/100G combination will be the best choice of next generation. From IDC research, the growth of 100G port is still in high speed, and the share of 100G port will exceed other ports in 2024. As a 64X100G switch, RA-B6910-64C will be a smart choice.

The following picture is the data center Ethernet switch revenue data that shows the market potential by speed. Base on those data you can find the revenue of 100G port will still grow fast till 2023. Then 400G and above port will be the most popular.



Source: Dell'Oro July 2020 - Long Term Ethernet Switch Forecast

3. Revision Table

Date	Revision #	Author	Description
Apr 29. 2021	0.01	Shawn Wu	
July 13. 2021	0.02	Zayne Xu Seen Xu	

4. Scope

This document defines the technical specifications for the RA-B6910-64C used in Open Compute Project.

5. Overview



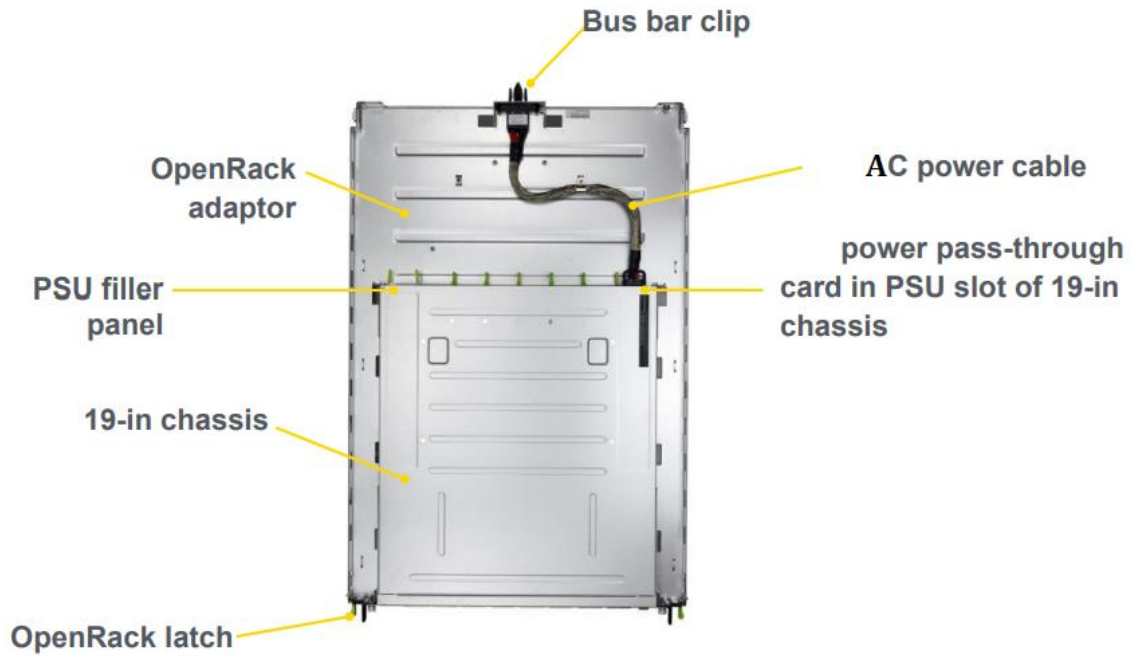
RA-B6910-64C is 2U high and 580mm deep Broadcom Tomahawk II chipset-based leaf/spine switch for data centers. The physical layer will consist of 64 port 100G zQSFP+ ports. The switch has a nominal operating temperature range from 0 to +40 centigrade.

The following are key features of RA-B6910-64C:

- Redundant and hot-swappable 800W PSU (1+1)
- Redundant and hot swappable fans (2+1)
- 64 port zQSFP+100G ports
- 1 x RJ45 10/100/1G GE management port
- Intel Broadwell-DE x86 4C8T 2.2GHz CPU
- BCM AST2520, 800MHz ARM11
- 1 x Type-A USB port
- 1 x RJ45 console port
- System LED & Reset button

6. Rack Compatibility

RA-B6910-64C does not support the OCP rack. To support the OCP rack, a matched switch-over rack needs to be developed.

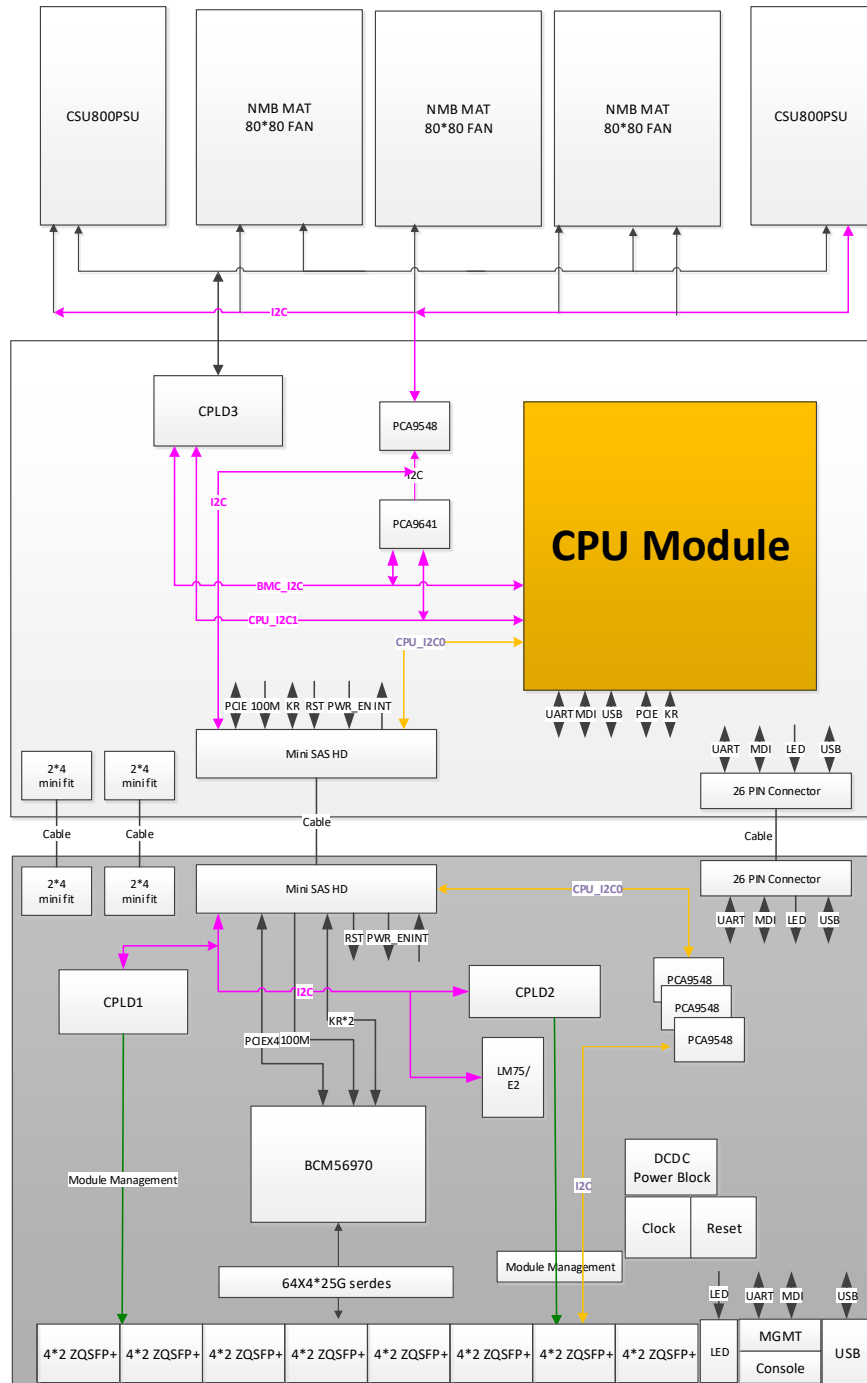


7. Physical Specifications

7.1. Block Diagram

The following picture shows the block diagram of the system:

Open Compute Project • RA-B6910-64C Hardware Specification

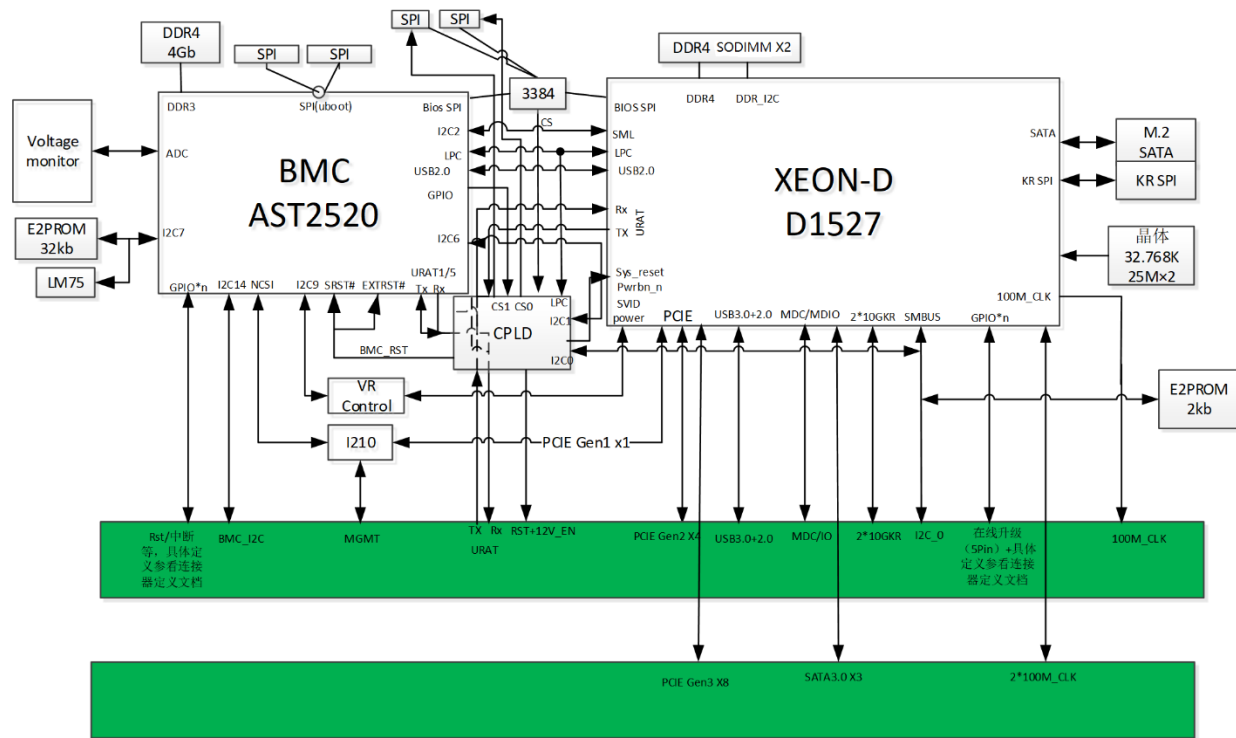


RA-B6910-64C is composed of the CPU module, switching module, power module, clock module, and other modules.

- 1) The CPU module consist of 5 different modules: CPU system, BMC system, board mount power, CPLD module and B2B connector.

- 2) The CPU system include Broadwell-DE x86 4C8T 2.2GHz CPU and AST2520 BMC which provide a mechanism to manage the switch hardware like a server. The system support up to 32GB DDR4 SO-DIMM with ECC.
- 3) The CPLD module focuses on the power sequence control and mux function. The other system related interface such as PCIe/I2C/USB were connected to B2B connector for whole system control.

The block diagram of the CPU module show below:

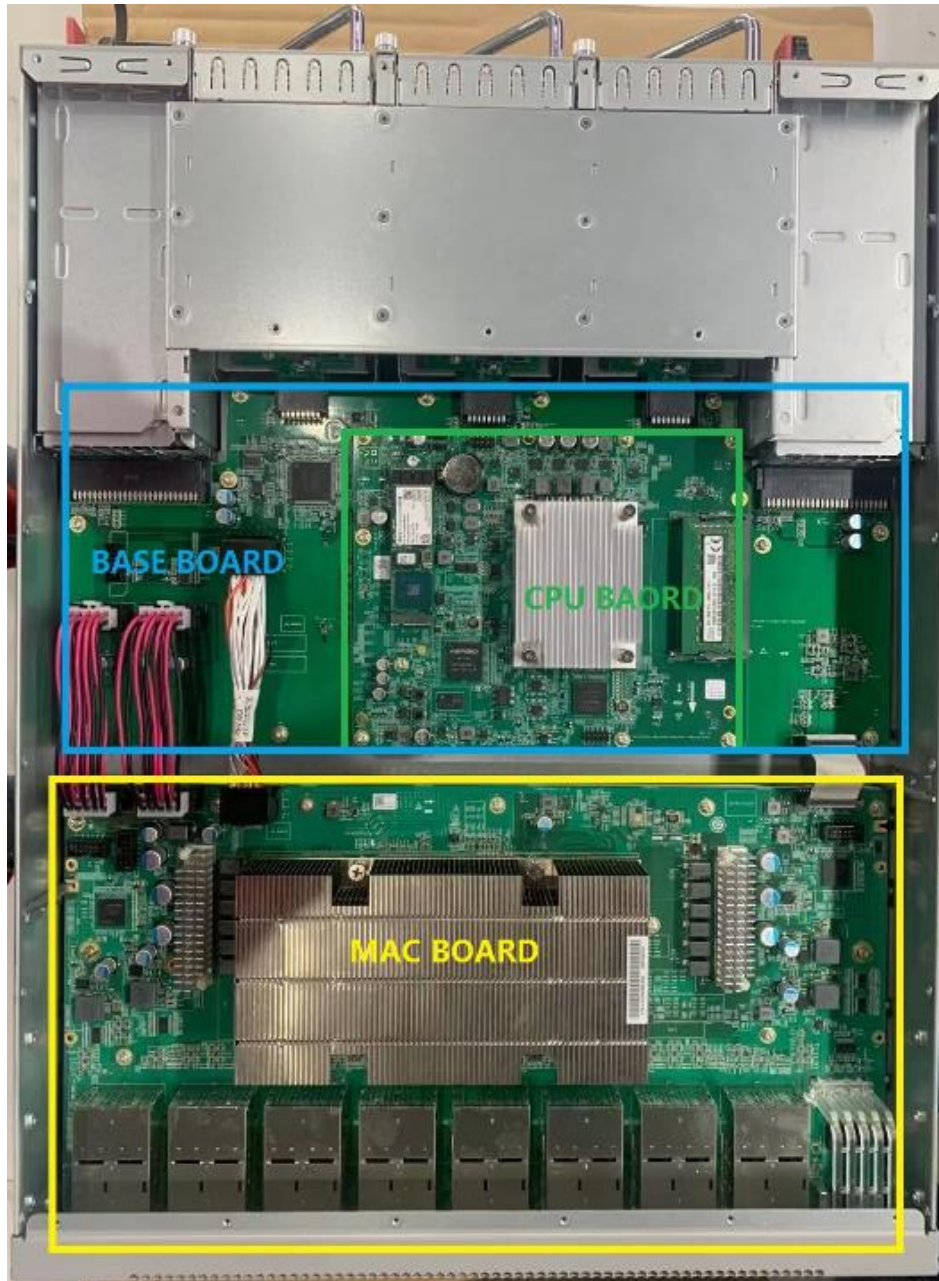


- 4) The switching module uses BCM56970 as the MAC chip and supports 6.4 Tbps switching bandwidth. The switch supports 64 x 100 Gbps interfaces, which are downward compatible with 40 Gbps interfaces. Due to the chip limit, a total of 128 logical interfaces are supported. Therefore, the switch supports a maximum of 128 x 25 Gbps SerDes interfaces. Among the supported interfaces, 20 x 100 Gbps interfaces each can be divided into 4 x 25 Gbps interfaces, and the port IDs of these 100 Gbps interfaces are 1–5, 17–21, 33–37, and 49–53.
- 5) The power and clock modules provide various voltages and chips on clock boards. The complex programmable logic device (CPLD) function is integrated with the hierarchical reset function.
- 6) The switch uses the LM75 chip for temperature monitoring (the MAC chip temperature is obtained using the on-chip temperature sensor). The CPU module manages and monitors the LM75 chip over the I²C channel.
- 7) The CPLD on the motherboard controls the LED indicators, drives fans to rotate and adjusts the fan speed over PWM signals, and provides the I²C controller to ensure intelligent control on the QSFP+ modules.
- 8) It also implements hierarchical reset for the switch components and provides some control

signals to the AC power supply.

7.2. Placement and Form Factor

The following figure shows the component placement and corresponding dimensions.



7.3. CPU and Memory

	RA-B6910-64C
--	--------------

CPU	Intel Broadwell-DE, 4 Core
BIOS FLASH	SPI FLASH 16MB x 2
RAM	DDR4 8GB SO-DIMM (Will install 1x 8G DIMM by default, can expandable up to 32GB, w/ ECC)
SSD	M.2 SSD 240G
BMC	AST2520, 800MHz ARM11
BMC FLASH	SPI FLASH 32MB x 2
BMC RAM	512MBDDR4

7.4. Platform Controller Hub (PCH)

Intel Broadwell-DE is a SOC that integrate a PCH inside the chip

7.5. I/O Subsystem

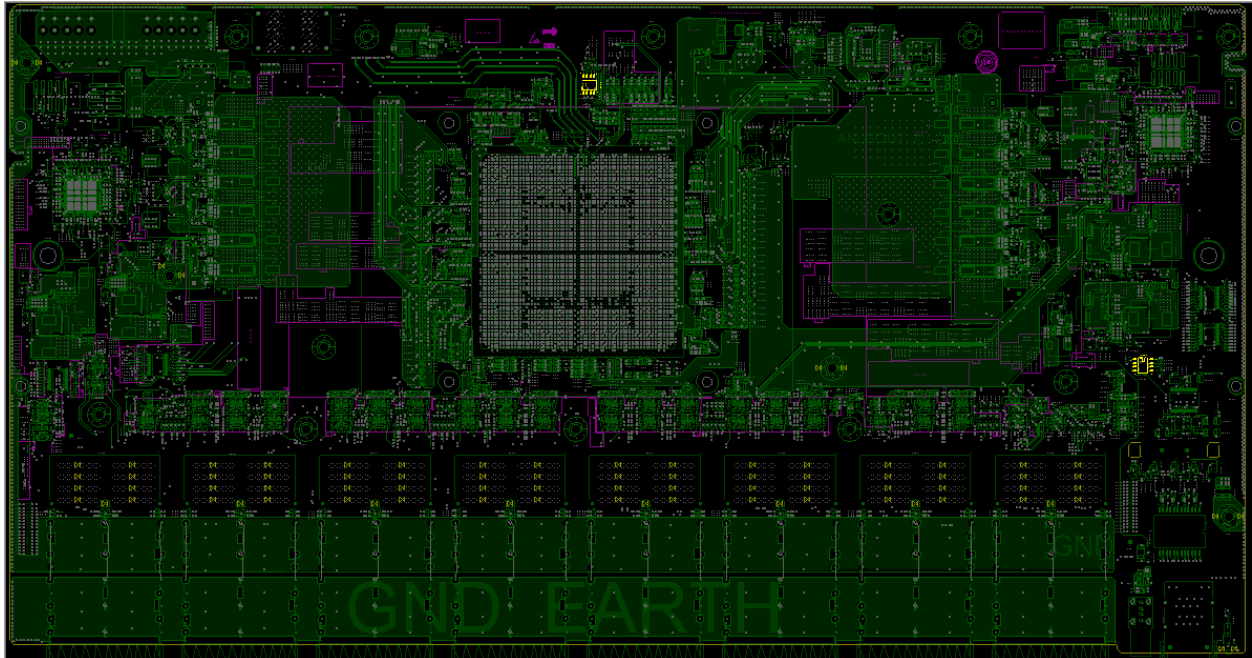
There are no other I/O subsystem in RA-B6910-64C

8. Thermal Design Requirements

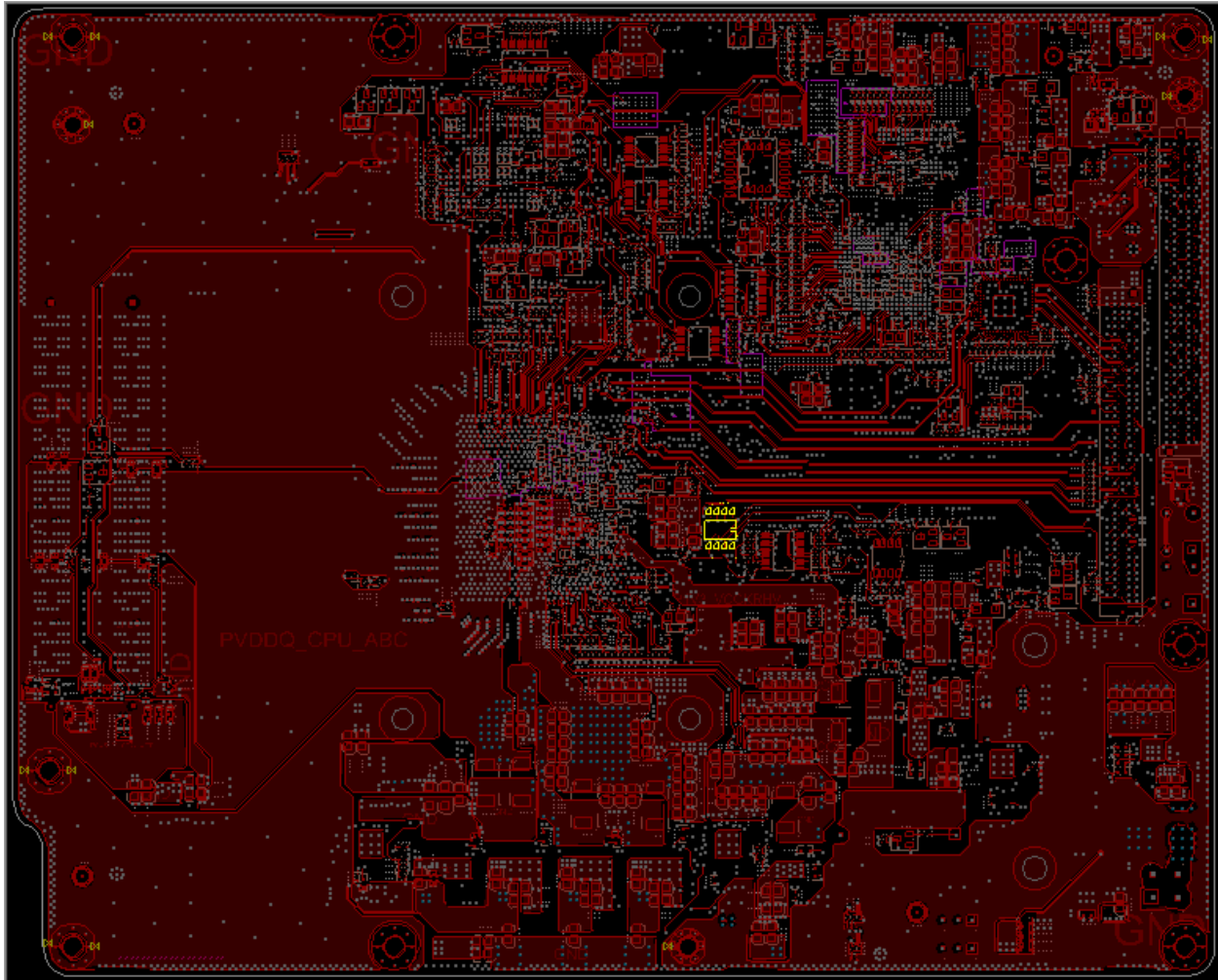
The chassis for RA-B6910-64C is a new design 440mmX490mmX2U box, the thermal design require the system normal operate under 3000m 40°C with one FAN failure.

There are on board thermal sensors to monitor the temperature. Following picture shows the location of the sensors:

MAC board:



CPU board:



The cooling FAN will control by CPLD and work in a smart FAN speed control strategy that will change FAN speed based on the system temperature to meet the thermal design requirement. The following table shows the environmental characteristics of RA-B6910-64C

Operating Temperature	32 to 104°F (0 to 40°C)
Storage Temperature	-40 to 158°F (-40 to 70°C)
Relative Humidity	10% to 90% non-condensing
Altitude (Operating)	Designed to meet: 0 to 6,000ft

Altitude (Non-operating)	-1000ft to 16,000ft
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8.1. Data Center Environmental Conditions

The ambient temperature of the data center of the system work on ranges from 0-40°C

8.2. Server Operational Condition

The operating temperature of the server ranges from 0-40°C

8.3. Thermal Kit Requirements

RA-B6910-64C does not require other thermal kit.

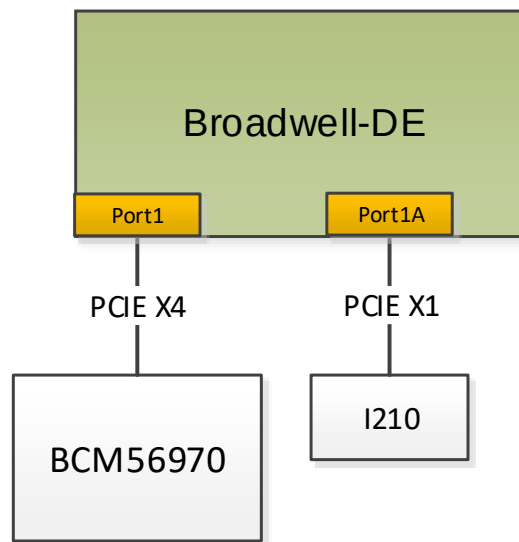
9. I/O System

9.1. PCIe

The Broadwell-DE provides 8 PCIe 2.0 lanes and 24 PCIe 3.0 lanes.

The system uses x1 PCIe Gen2 in CPU board to communicate the OOB. There are another x4 PCIe GEN2 that connect to BCM56970 on MAC board

The following picture show the PCIe configuration.



9.2. DIMM Sockets

The system has 2 DDR4 SO-DIMM sockets on CPU boards. It will install 1x8G by default and it can be expanded up to 32GB with 2x16G.

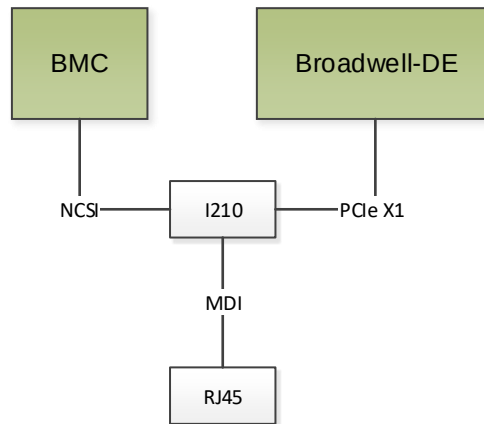
9.3. NIC Module

There is no additional NIC module in this system.

9.4. Network

The management network port in RA-B6910-64C is controlled by CPU module using the Ethernet controller I210 chip. The MGMT port can also control by BMC use NCSI interface in I210 controller.

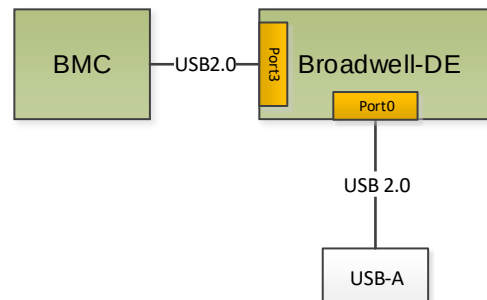
The following picture show the MGMT configuration.



9.5. USB

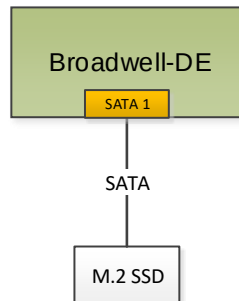
RA-B6910-64C supports two USB 2.0 ports, USB 2.0 port 3 is interconnected with the USB port of the BMC chip. USB 2.0 port 0 is interconnected with the connector and is connected to the front panel to serve as a USB port.

The following picture show the USB configuration.



9.6. SATA

RA-B6910-64C uses one SATA interface, that is, SATA1 to connect to the M.2 interface. The following picture show the STAT configuration.



9.7. M.2

RA-B6910-64C uses the M.2 SSD solution and supports SATA. Socket 3 of the M key type is selected for the M.2 interface and only support 2280 M key SSD.

9.8. Debug Header

The location and description of the debug headers on board show below:



1. Base board CPLD download

Pin Number	Pin Name
1	TCK
2	GND
3	TDO
4	P3V3_STBY
5	TMS
6	NC

7	NC
8	NC
9	TDI
10	GND

2. 12V input(optional)

Pin Number	Pin Name
1	GND
2	GND
3	12V IN
4	12V IN

3. CMOS clear header

Connect 1-2: NOMARL RTC RESET (DEFAULT)

Connect 2-3: CLEAR RTC REGISTERS

4. PMBUS header

Pin Number	Pin Name
1	NC
2	NC
3	NC
4	NC
5	NC
6	GND
7	NC
8	PMB_ALERT
9	PMB_CLK
10	PMB_DIO

5. CPU board CPLD download

Pin Number	Pin Name
1	TCK
2	GND
3	TDO
4	P3V3_STBY
5	TMS
6	NC
7	NC
8	NC
9	TDI
10	GND

6. JTAG boundary scan

Pin Number	Pin Name
1	TCK
2	GND
3	TDO
4	P3V3_STBY
5	TMS
6	TRST
7	NC
8	NC

9	TDI
10	GND

7. MAC board CPLD download

Pin Number	Pin Name
1	TCK
2	GND
3	TDO
4	P3V3_STBY
5	TMS
6	NC
7	NC
8	NC
9	TDI
10	GND

8. MAC VR power image download

Pin Number	Pin Name
1	SDA
2	ALERT
3	SCL
4	GND
5	NC
6	NC
7	NC
8	NC
9	NC
10	NC

9.9. LEDs

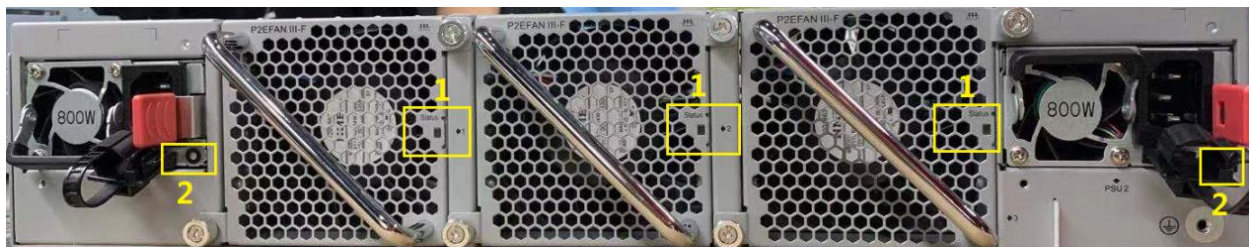
The location and description of the LEDs on board show below:



1. Base board CPLD status indicator LED
2. CPU board CPLD/Boot status indicator LED
3. MAC board CPLD1 status indicator LED
4. MAC board CPLD2 status indicator LED



1. Upper ports status indicator
2. Lower ports status indicator
3. System status indicator
4. MGMT port status indicator



1. FAN status indicator
2. PSU status indicator

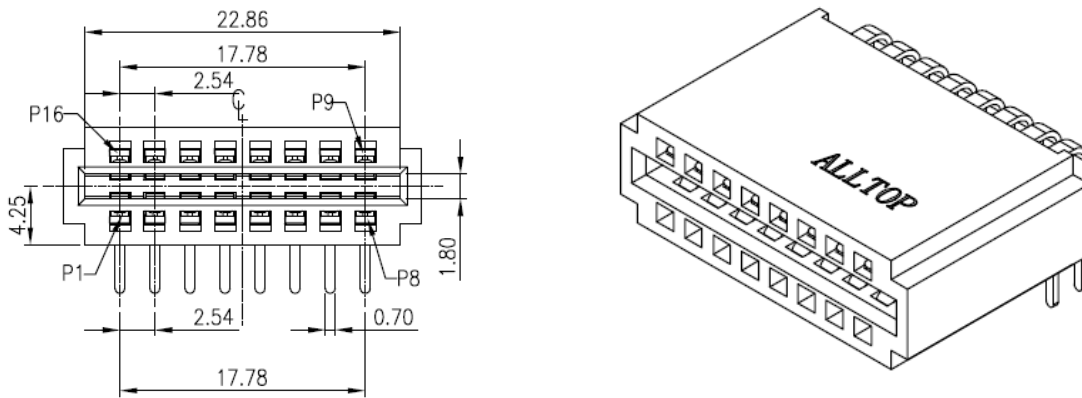
The following table shows the definition of the LED.

LED Name	Definition
System status--BCM	Green flashing: booting/upgrading Solid green: normal operation Solid yellow: error Solid red: fatal error
System status--SYS	Green flashing: system boot Solid green: normal operation Solid yellow: error Solid red: fatal error
System status--PSU	Solid green: normal operation Solid yellow: error Solid red: fatal error
System status--FAN	Solid green: normal operation Solid yellow: error Solid red: fatal error
System status--LCT	Off: normal operation On: ID for maintainer
MGMT link	Off: link is down Solid green: link up
MGMT ACT	Yellow flashing: active
Port LED	Solid green: port link up Green flashing: 25G/100G active Solid yellow: port shutdown Yellow flashing: 10G/40G active Solid red: link is down w/o shutdown
PSU status	Green flashing: backup Solid green: normal operation

	Red flashing: OCP/UVLP/OVP/FAN_FAULT/OTP Solid red: fatal error
FAN status	Solid green: normal operation Solid red: FAN failure

9.10. Fan connector.

The system fan connector is C210U8-11631-Y from ALLTOP, its form factor and signal definition show below:



Pin Number	Pin Name	Pin Number	Pin Name
1	FAN_Present#	9	GND
2	FAN_EN#	10	GND
3	FAN_POWER_OK	11	GND
4	SCL	12	LED2
5	LED1	13	SDA
6	FAN_E2_WP	14	Fan_SPEED
7	VDD12V	15	FAN_PWM
8	VDD12V	16	NC

Signal	Description	Input/Output	Notes
VCC12V	12 V power supply from the motherboard to the fans	Power	Each pin can support 5 A current.
FAN_Present#	Fan module present signal	Output	High: FAN module doesn't present

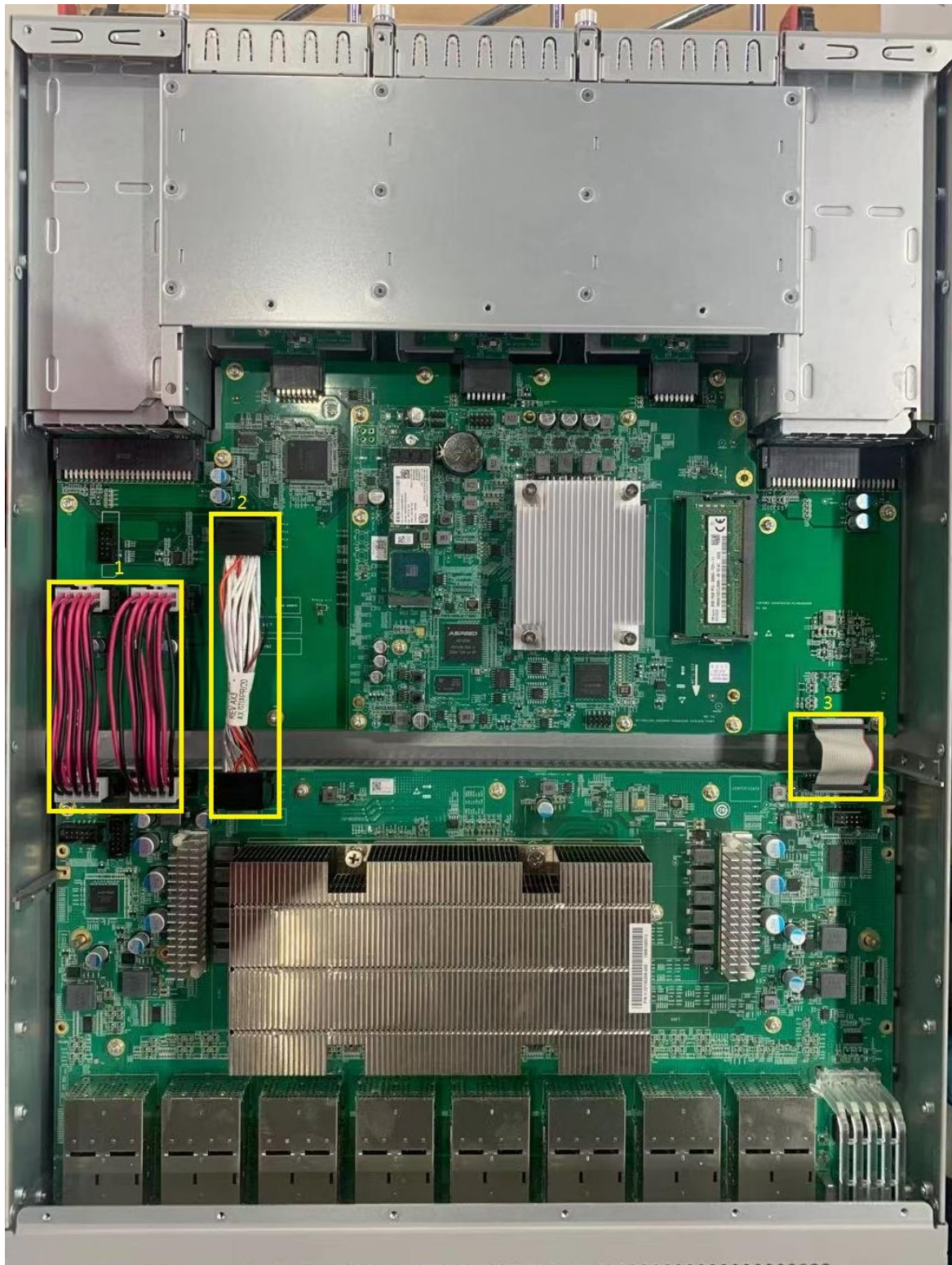
			Low: FAN module present
FAN_EN#	Power supply enable signal of the fan module	Input	
SCL/SDA	I2C signal	Bi-direction	
LED1/LED2	Fan module status indicator signal	Input	1.Solid green: normal operation. 2.Solid red: FAN failure.
PWM	Fan speed control	Input	
Fan_SPEED	Fan speed monitoring	Output	
FAN_POWER_OK	Fan tray power-on signal	Output	

9.11. TPM Connector and Module

The system doesn't support TPM module

9.12. Sideband Connector

The following picture shows the sideband connectors in the system



1. Power connector

Pin Number	Pin Name
------------	----------

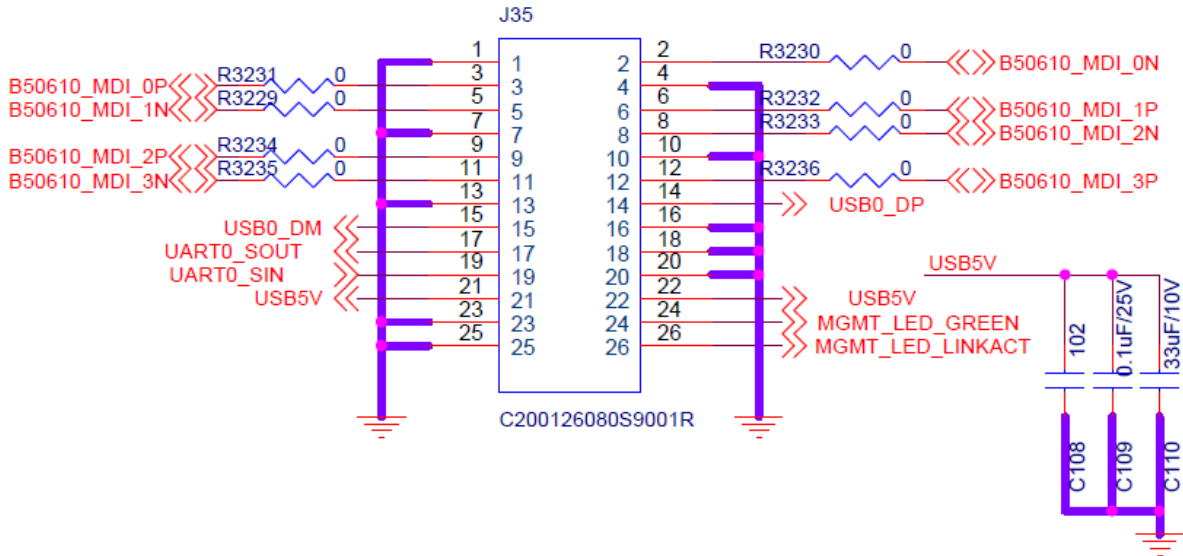
1	GND
2	GND
3	GND
4	GND
5	GND
6	12V
7	12V
8	12V
9	12V
10	12V

2. MISC

Pin Number	Pin Name
B9/B18	GND
B8/B17	MC_RDN0
B7/B16	MC_RDPO
B6/B15	GND
B5/B14	MAC_PCIE_RXN2
B4/B13	MAC_PCIE_RXP2
B3/B12	GND
D1/D10	SW_BOARD_RST#
D2/D11	SW_BOARD_PWR_EN
C2/C11	ONLINE_CPLD_UPDATE
C1/C10	ONLINE_TCK
A3/A12	GND
A4/A13	MAC_PCIE_RXP3
A5/A14	MAC_PCIE_RXN3
A6/A15	GND
A7/A16	RESERVE
A8/A17	RESERVE
A9/A18	GND
D9/D18	GND
D8/D17	MC_TDPO
D7/D16	MC_TDNO
D6/D15	GND
D5/D14	MAC_PCIE_TXN2
D4/D13	MAC_PCIE_TXP2
D3/D12	GND
B1/B10	ONLINE_TDO
B2/B11	ONLINE_TMS
A2/A11	SW_BOARD_INT#
A1/A10	ONLINE_TDI
C3/C12	GND
C4/C13	MAC_PCIE_TXP3

C5/C14	MAC_PCIE_TXN3
C6/C15	GND
C7/C16	BMC_I2C_SDA
C8/C17	BMC_I2C_SCL
C9/C18	GND

3. MGMT/USB/Console



9.13. VGA header

There is no VGA header in this system.

10. Rear Side Power, I/O and Midplane

The rear side of RA-B6910-64C will provide the power supply units' slots and FAN modules' slots.

The following picture shows the power supply unit and the special feature.

CSU800 Series

800 Watts
Distributed Power System

Total Power: 800 Watts
Input Voltage: 90-264 Vac
164-320 Vdc
of Outputs: Main and Standby



Special Features

- 800W output power
- High power and short form factor
- 1U power supply
- High density design: 25 W/in³
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80 Plus® Platinum efficiency
- N+M redundant $N+M \leq 4$
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus™ compliant
- Accurate input power reporting

- EN61000-4-5 surge level 2kV/4kV DM/CM
- Compatible with Artesyn's Universal PMBus GUI
- Reverse airflow option
- Conducted/Radiated EMI Class A
- EN61000-4-11

Safety

UL/cUL
UL + CB Report
CE Mark
CCC
BSMI
KC
TUV

Power Supply	800W
Input Voltage	100-240V AC 240V DC

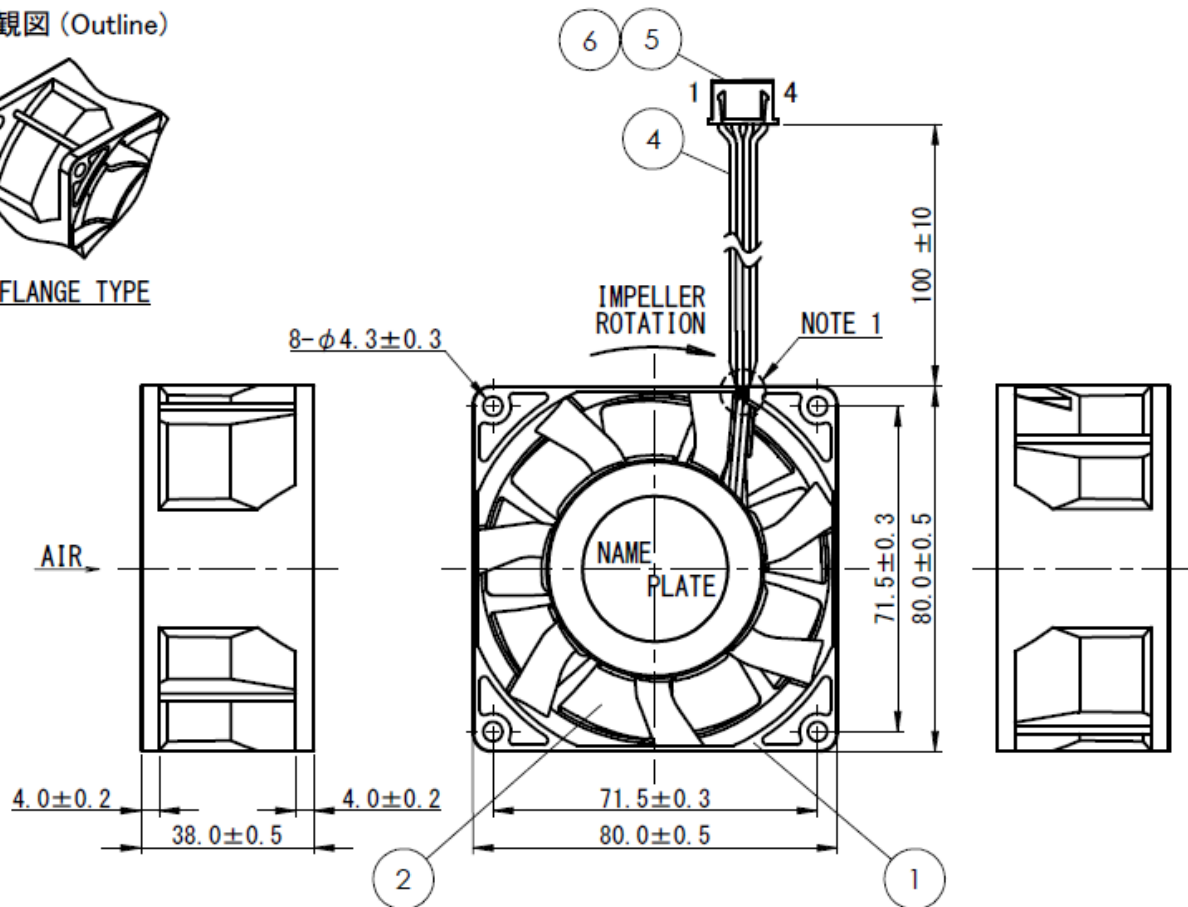
Typical Input Current	10-5A (AC) 4.5A (DC)
Input Frequency (AC)	50~60Hz
Input Connector	IEC 320-C13
Efficiency (Typical)	94% Platinum

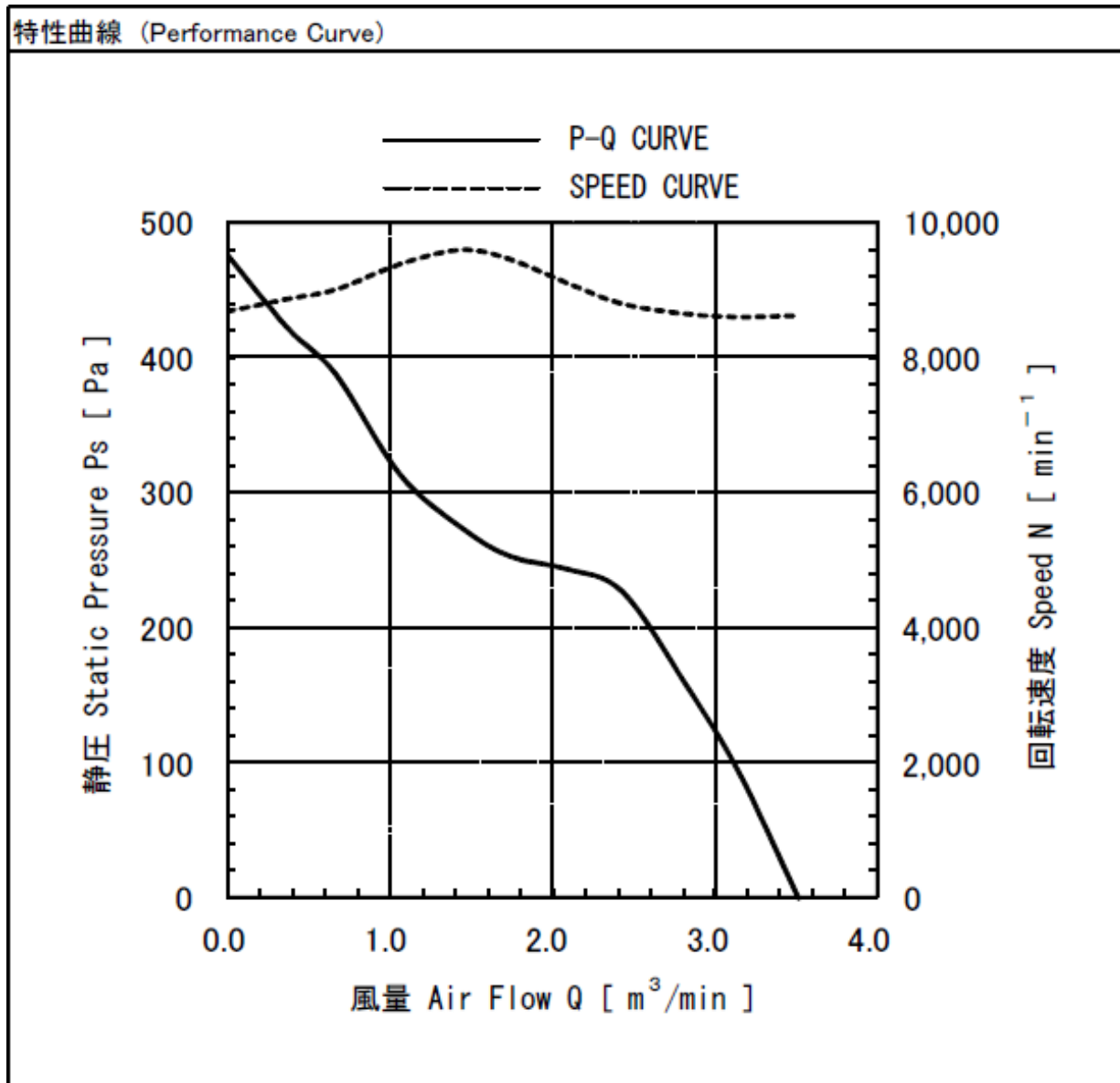
The following picture shows the FAN and its feature.

外觀圖 (Outline)



FLANGE TYPE





10.1. Overview of Footprint and Population Options

On the rear side, there are 2 PSU slots and 3 FAN slots, provide hot-pluggable 1+1 redundancy power module and 2+1 redundancy cooling fan module to meet the high reliability requirement of datacenter and carrier networks.

The air flow of the system is only support front to rear direction, and only support CSU800AP-3-300 from ARTESYN.

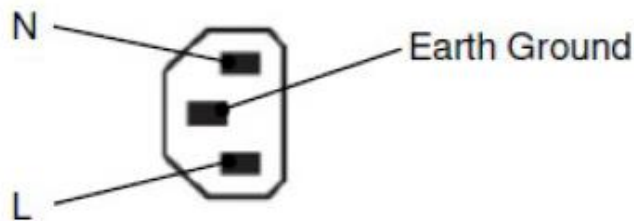
The footprint of the rear side show below:



1. PSU slot
2. PSU status LED
3. FAN module slot
4. FAN status LED
5. Asset tag
6. GND

10.2. Rear Side Connectors

There are 2 IEC320-C14 form factor PSU input connectors in the rear side of this system. The definition of the pins is show below:



10.3. Midplane

NA

11. Mechanical

11.1. Single Side Sled Mechanical

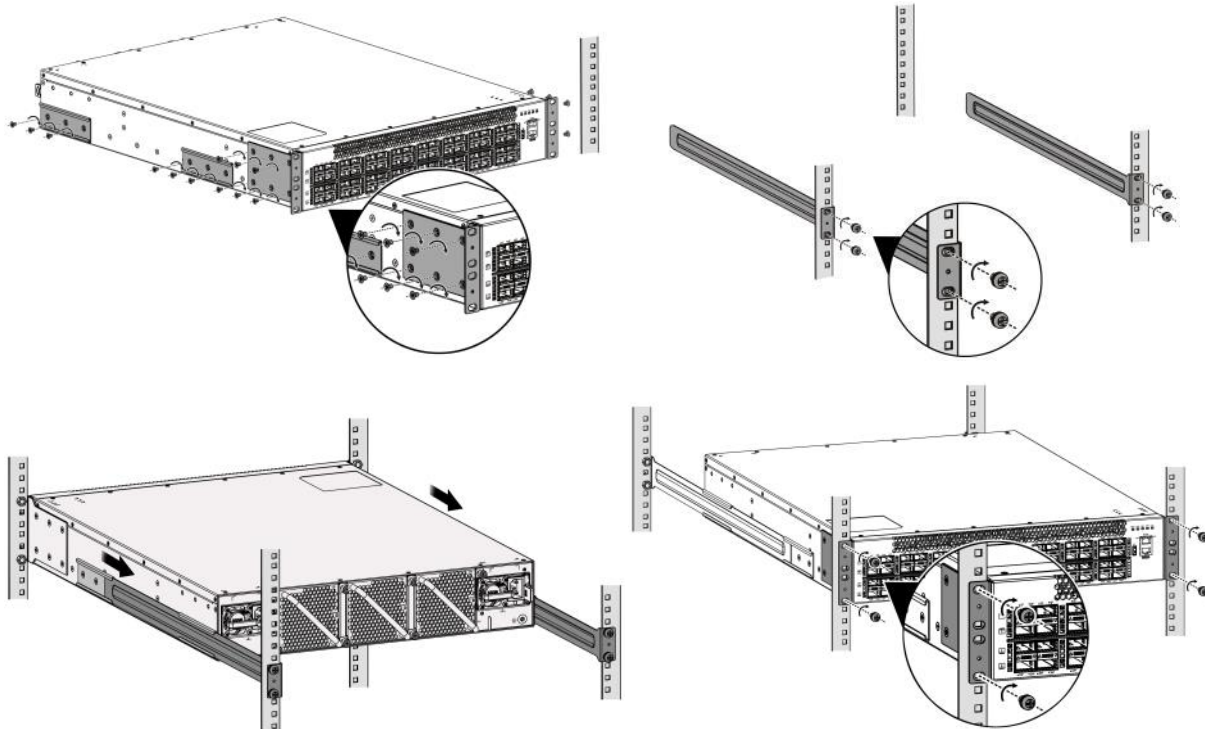
RA-B6910-64C does not support single-sided slider rails.

11.2. Double Side Sled Mechanical

RA-B6910-64C is an Electronic Industries Association (EIA) compliant device and can be installed in a 19-inch rack. During installation, place the switch on the rack, with the front panel facing forward. You are advised to use a tray to install the switch and then fasten the switch to

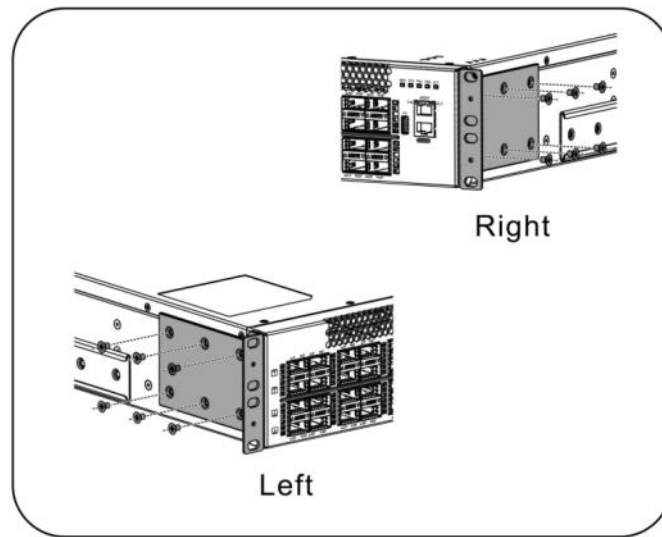
the rack of the cabinet. Alternatively, use rear brackets delivered with the switch to fasten the switch.

The following pictures show how to install RA-B6910-64C to the Rack.



11.3. Fixed Locations

The following picture shows the fixed location for RA-B6910-64C



11.4. PCB Thickness

The dimension of MAC PCB is 237 x 430 mm x4mm.
The dimension of CPU PCB is 205 x 139.35 mm x2mm.
The dimension of BASE PCB is 430mm x 188mm x2.5mm.
The dimension of FAN PCB is 60.2 x 59.56mm x1.6mm.

11.5. Heat Sinks and ILM

There are 3 different heatsinks used in the system. More details show below:

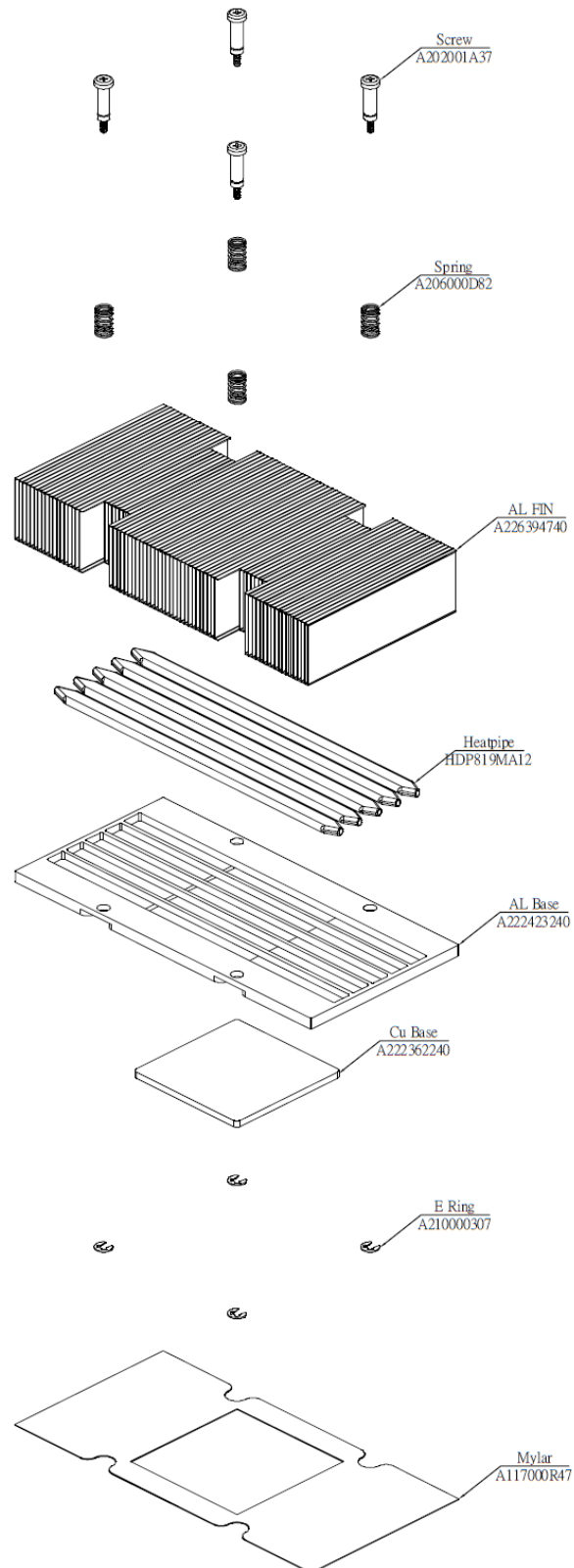
1. The heatsink for MAC ASIC on MAC board.

MPN: SF41010001 from AVC

Dimension: 200 x 100 x 41.5mm

Fastener: Screw x 4

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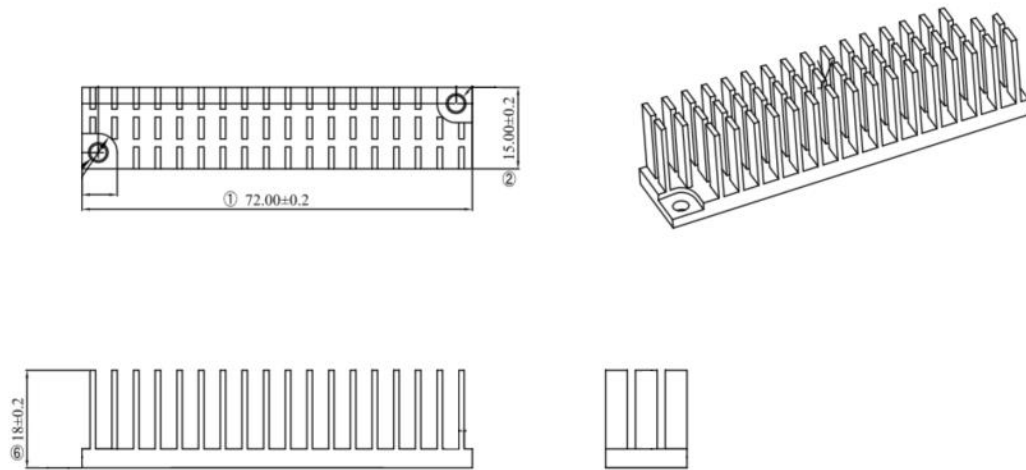
2. The heatsink for power MOS on MAC board.

MPN: FXW1120 from Heathinker Technology

Material: AL6063-T5

Dimension: 200 x 100 x 41.5mm

Fastener: Screw x 2



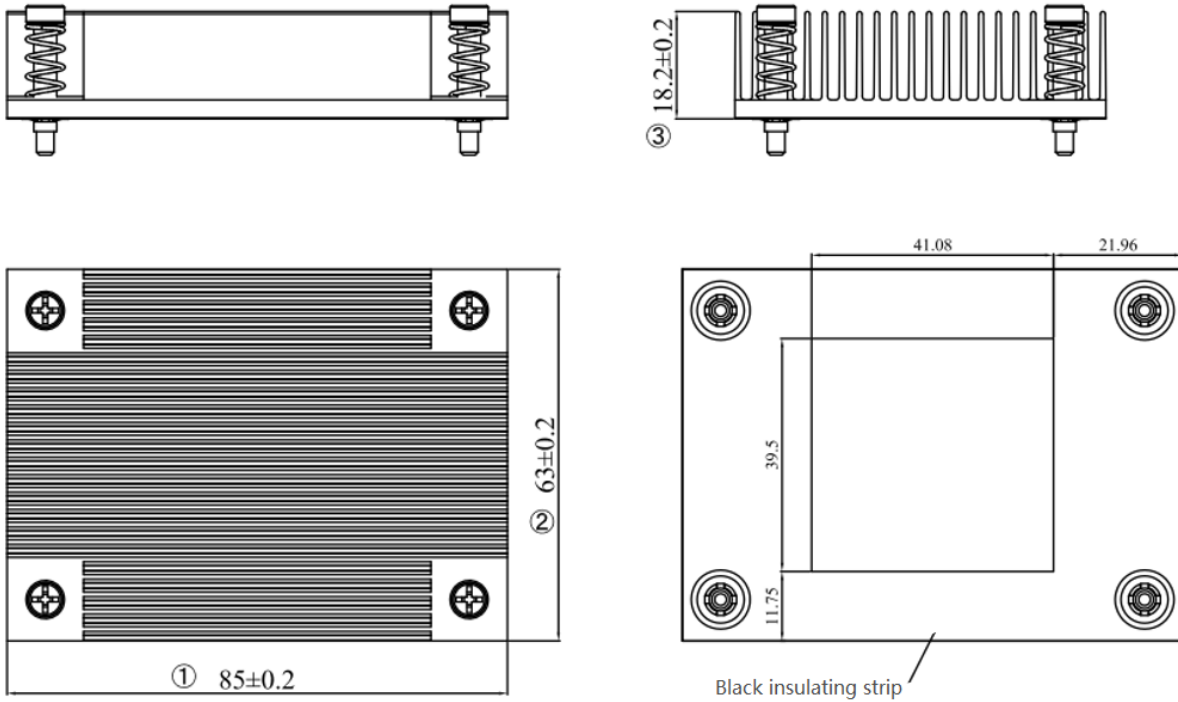
3. The heatsink for CPU on CPU board.

MPN: FXW1126 from Heathinker Technology

Material: AL6063-T5

Dimension: 85 x 63 x 18mm

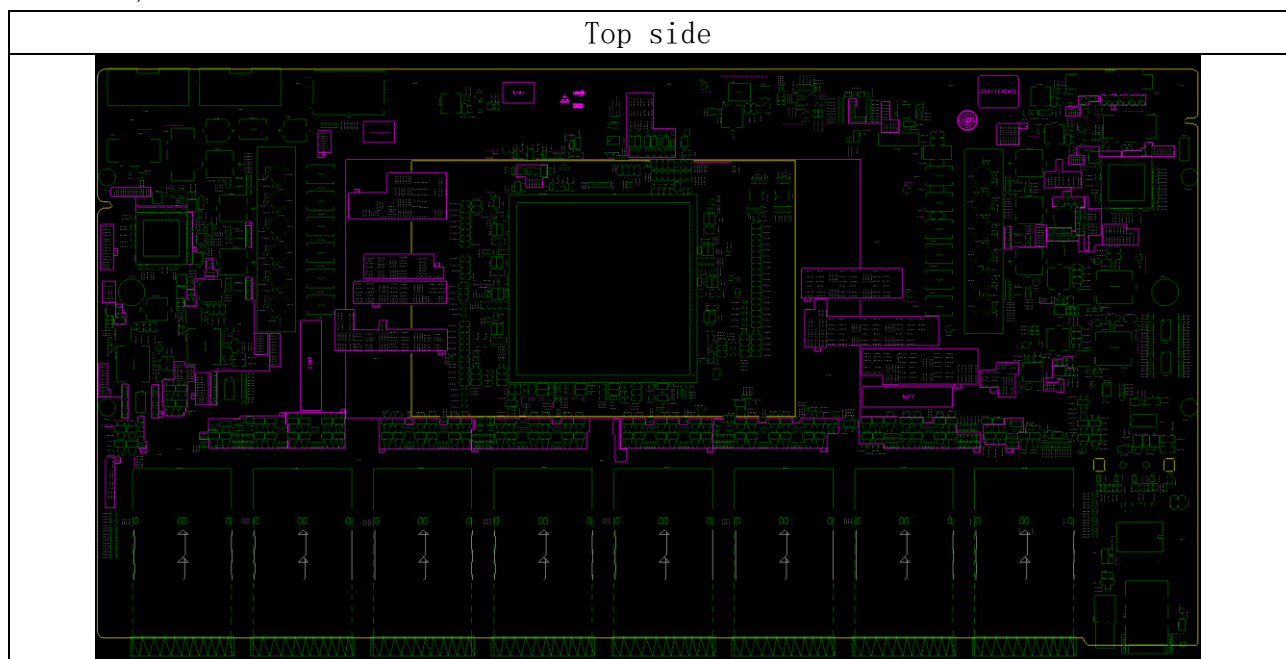
Fastener: Screw x 4

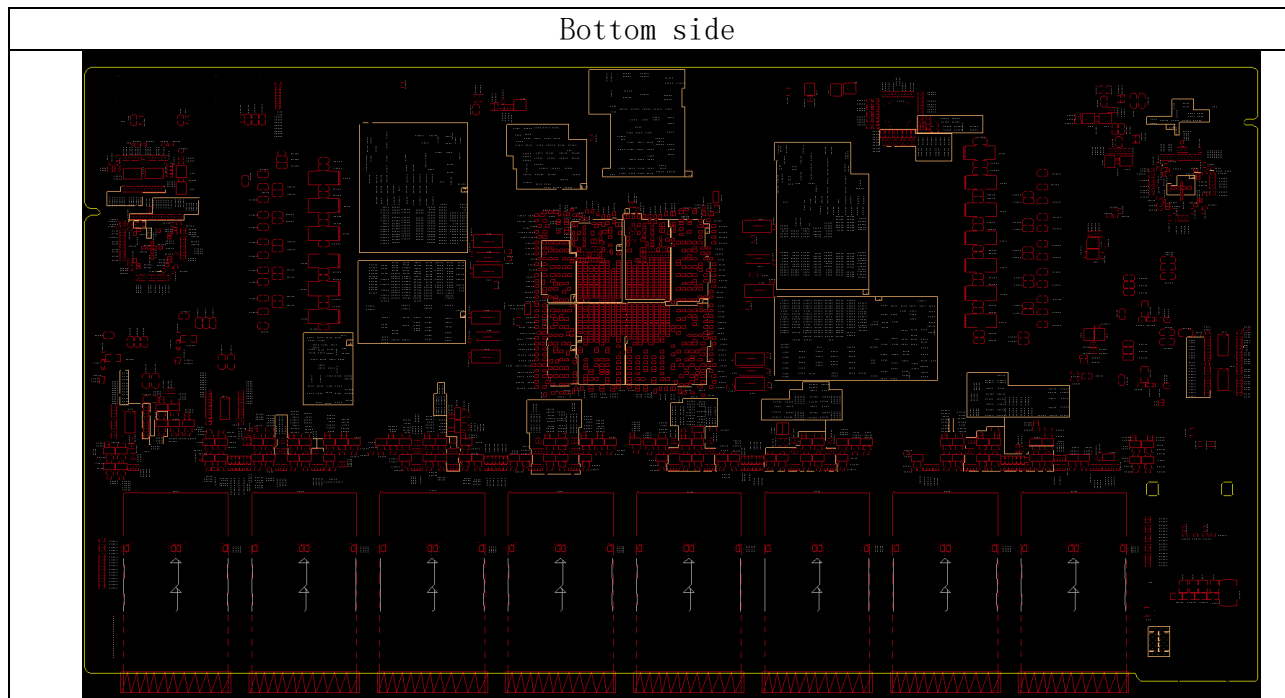


11.6. Silk Screen

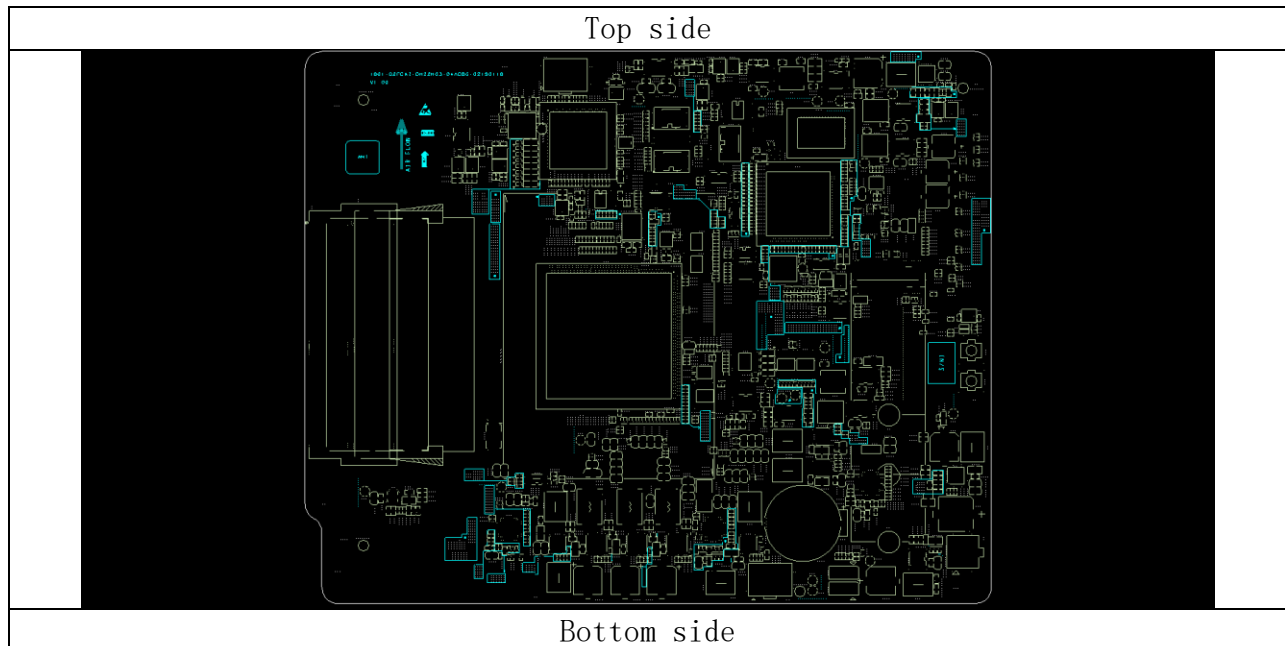
Below section shows the silkscreen of each PCB.

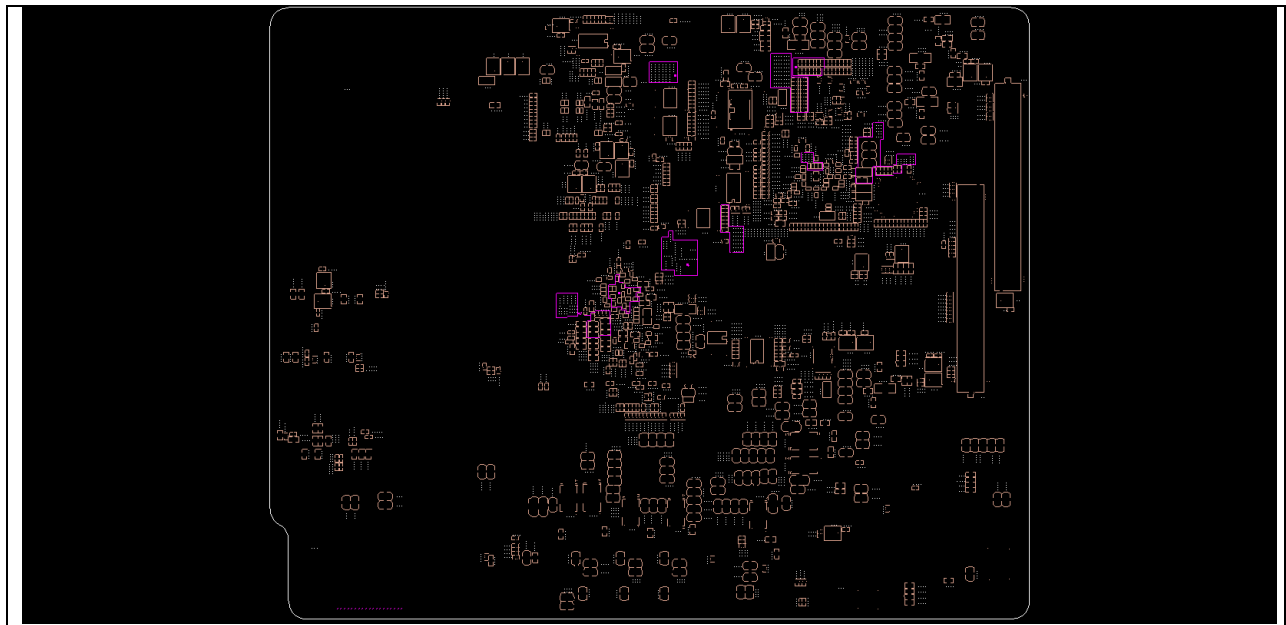
- 1) The Silkscreen of MAC board show below:



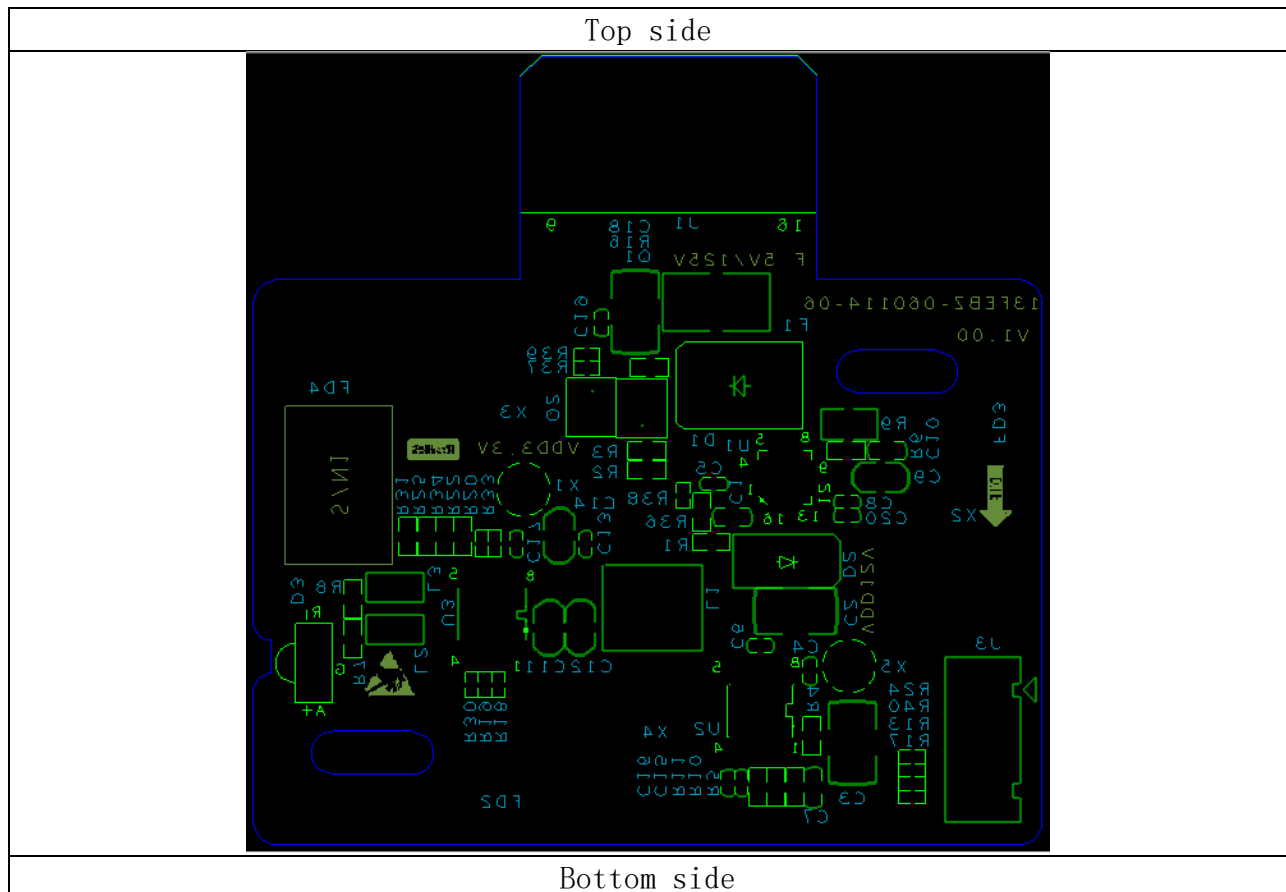


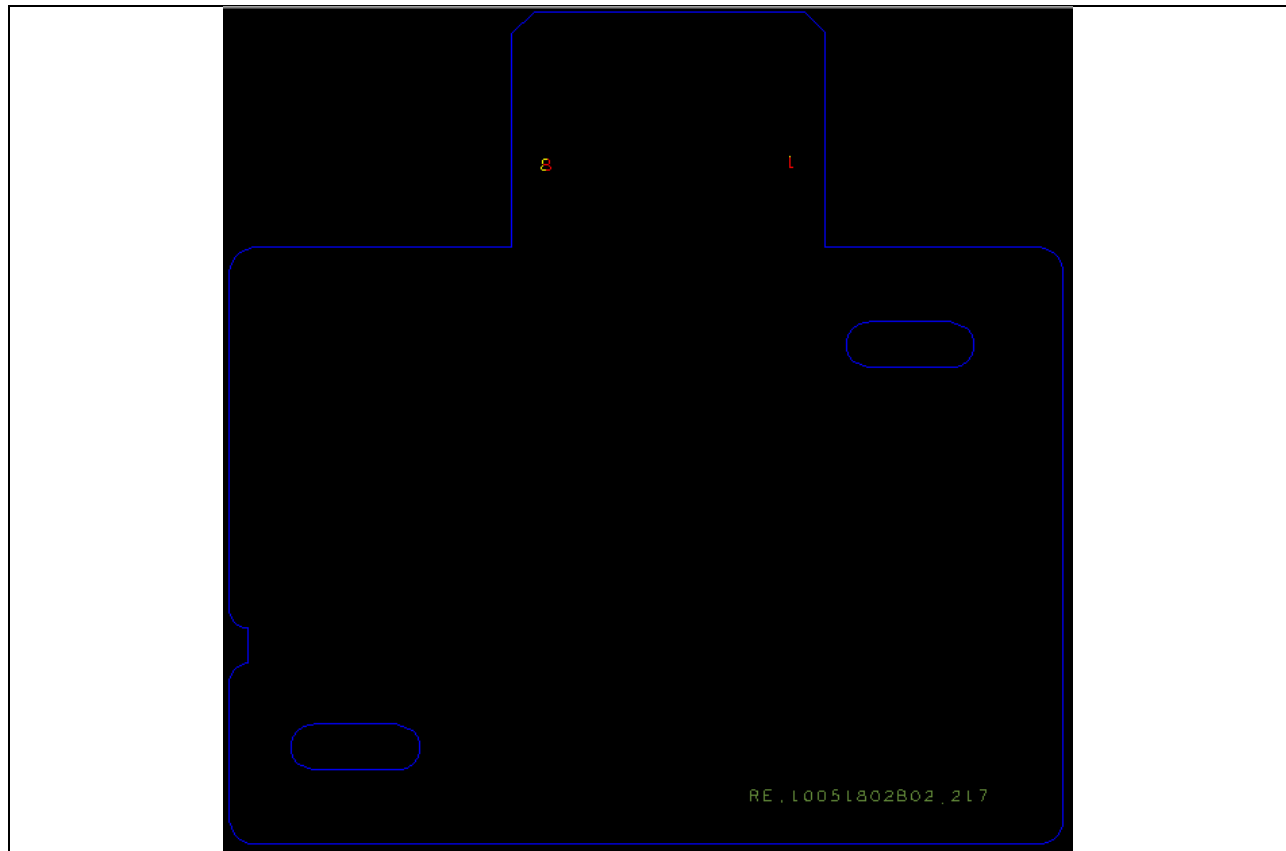
2) The Silkscreen of CPU board show below:



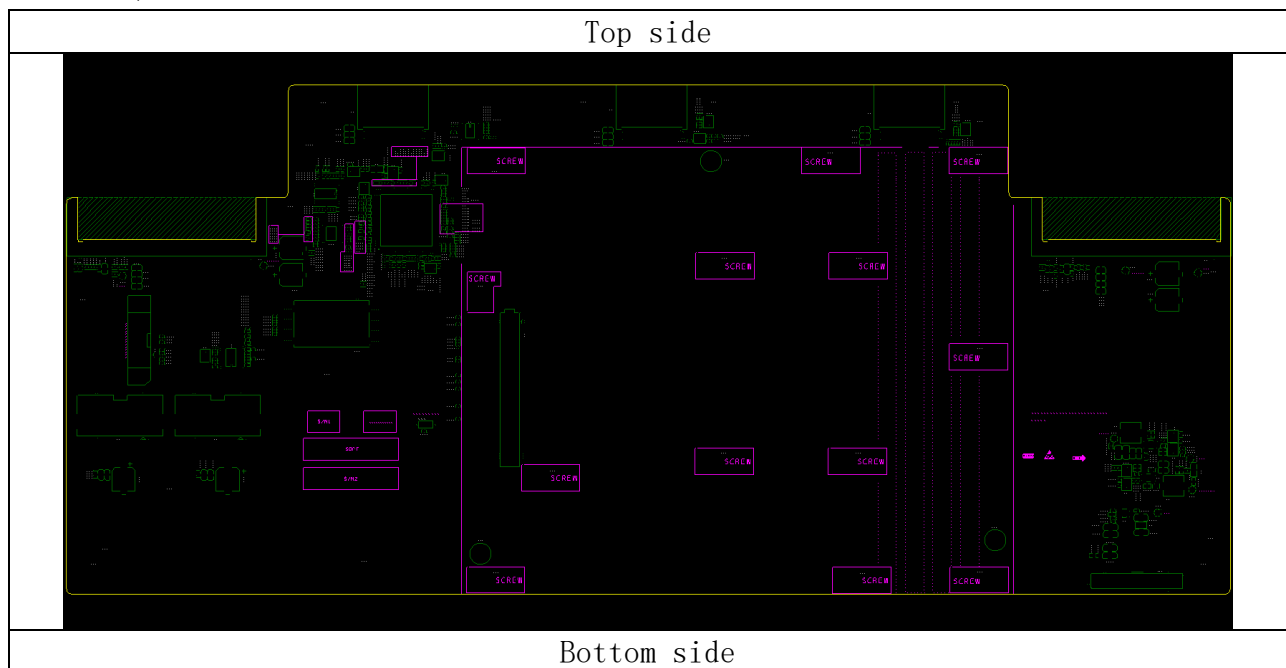


3) The Silkscreen of FAN board show below:





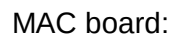
1) The Silkscreen of BASEboard show below:



SODIMM: Surface plating Au 15U, pressure 300V

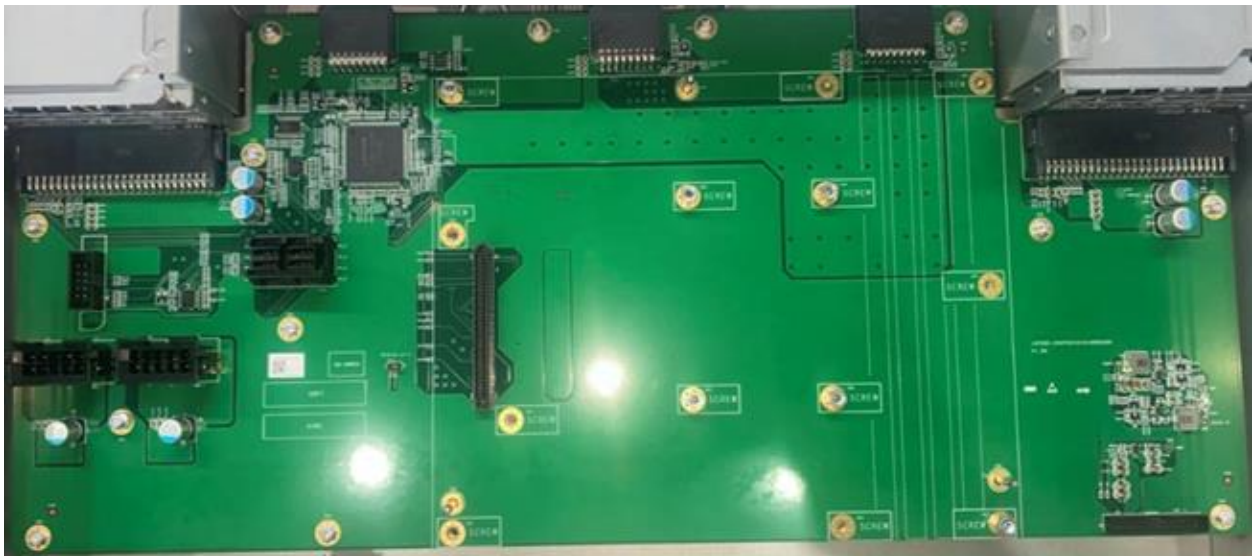


There are totally 4 PCBs in this system, each PCB shows below:
CPU board:

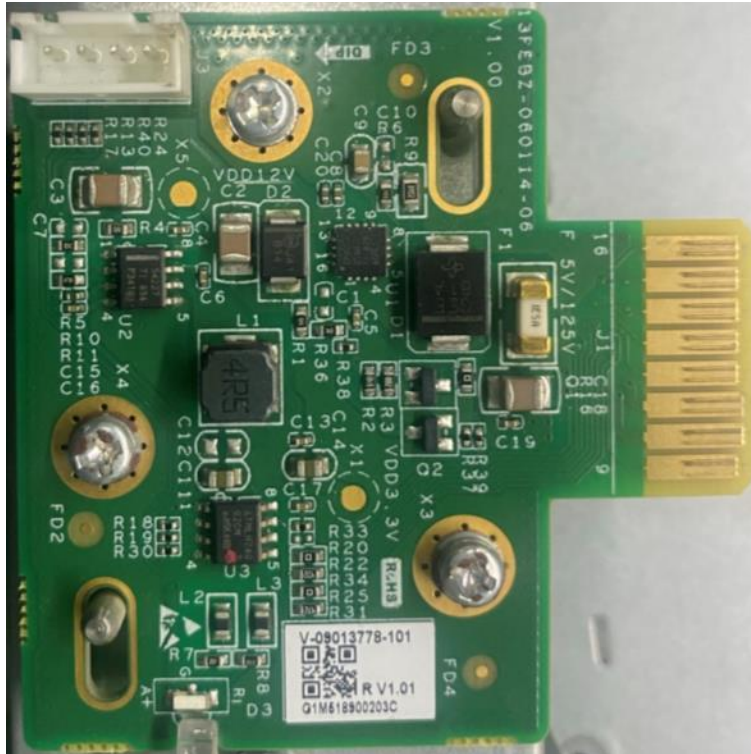




BASE board:

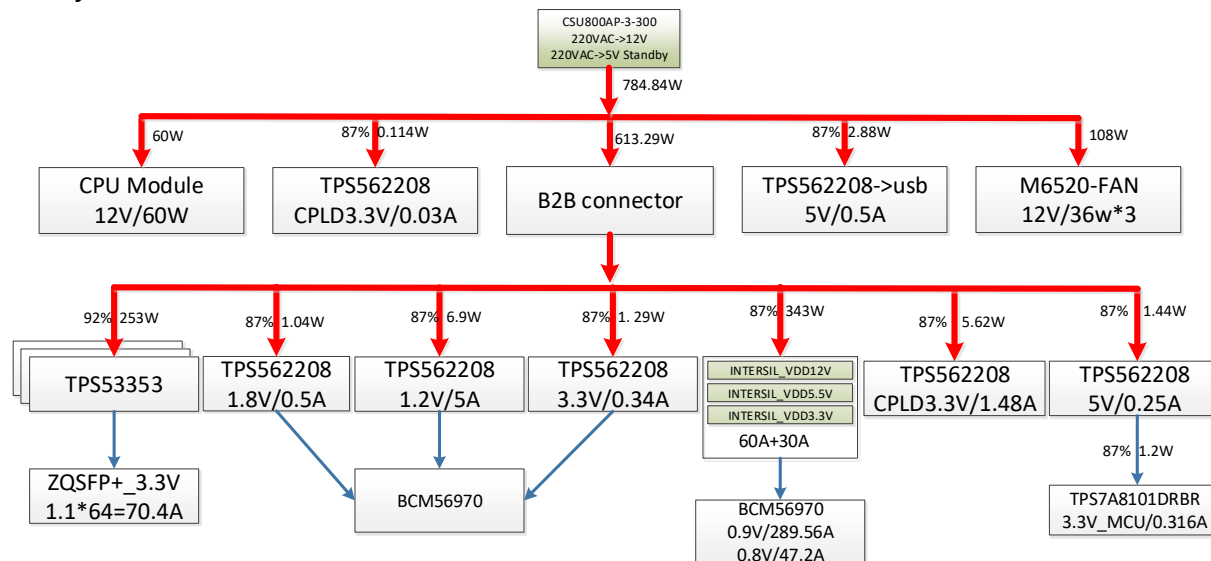


FAN board:



12. Motherboard Power System

The following block diagram shows the power solution and the estimated power consumption of the system.

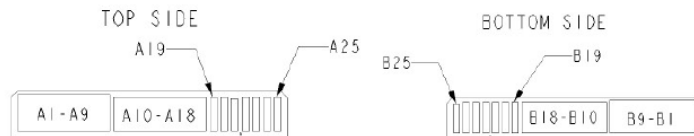


12.1. Input Voltage

The input voltage from the PSU is 12V, the output pin define of PSU is as below.

Output Connector – Power Blades

A1-A9	-	Main Output Return
A10-A18	-	+ Main Output (V_O)
B1-B9	-	Main Output Return
B10-B18	-	+ Main Output (V_O)



Output Connector – Control Signals

A19	-	SDA
A20	-	SCL
A21	-	PSON
A22	-	SMBAlert#
A23	-	-VSENSE
A24	-	+VSENSE
A25	-	PWOK
B19	-	A0 (SMBus address)
B20	-	A1 (SMBus address)
B21	-	12V _{SB}
B22	-	CR_BUS#
B23	-	12V load share
B24	-	Present
B25	-	Reserved

View from power supply output connector end

12.2. Hot- Swap Controller (HSC) Circuit

Hot swap design of the power module:

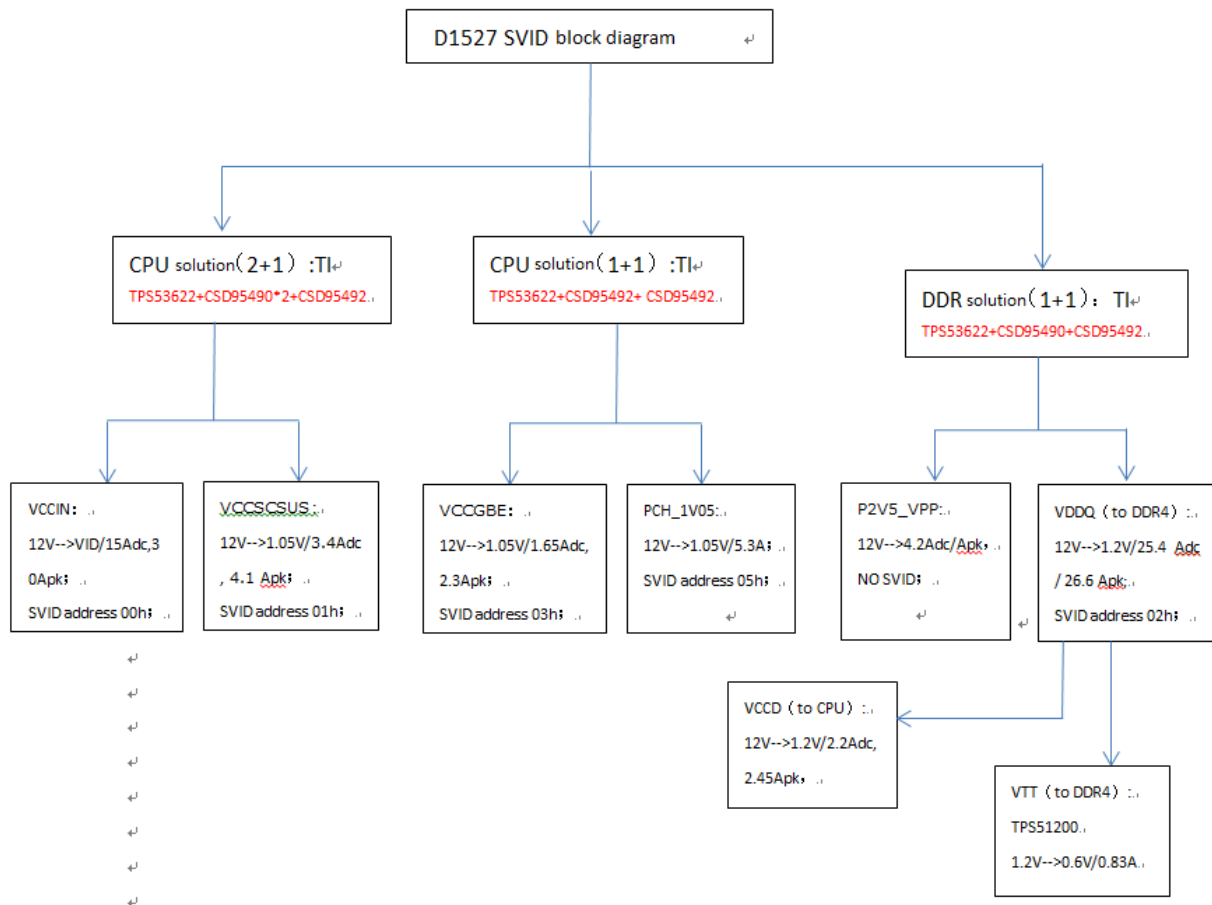
1. The power module supports hot swap.
2. Incorrect insertion is prevented through mechanical design.
3. I²C signals are isolated using the 9548 chip on the motherboard. The control cable is directly connected to the CPLD chip that supports hot swap.
4. Hot swap does not affect power supply to the switch.

Hot swap design of the fan module:

1. The fan modules support hot swap.
2. The TPS2590 chip is used for slow power supply and control.
3. IC signals are isolated using the 9548 chip on the motherboard. The control cable is directly connected to the CPLD chip that supports hot swap.
4. Hot swap does not affect the switching function of the switch.

12.3. CPU VR

The following picture shows the power rails topology of CPU board



CPU D1500 requires five SVID power supply voltages, that is, VCCIN, VCCSCSUS, VCCGBE, P1V05_PCH, and VDDQ. VCCIN, VCCSCSUS use TI TPS53622 to implement the 2+1 output solution. The MOS used are CSD95490 x2 and CSD95492 x1.

12.4. DIMM VR

DIMM VR use TI TPS53622 to implement the 1+1 output solution. The MOS used are CSD95490 x1 and CSD95492 x1.

12.5. MCP (Multi Core Package) VRM

NA

12.6. VRM design guideline

TPS53622 and TPS53679 are dual-channel step-down controllers that fully comply with the Intel VR13 (compatible with VR12.5 and VR12) SVID standard. They are built in with the non-volatile memory (NVM) and PMBus interface, and are fully compatible with the TI NexFET power stage. Advanced control features such as the D-CAP+ architecture with undershoot reduction (USR)

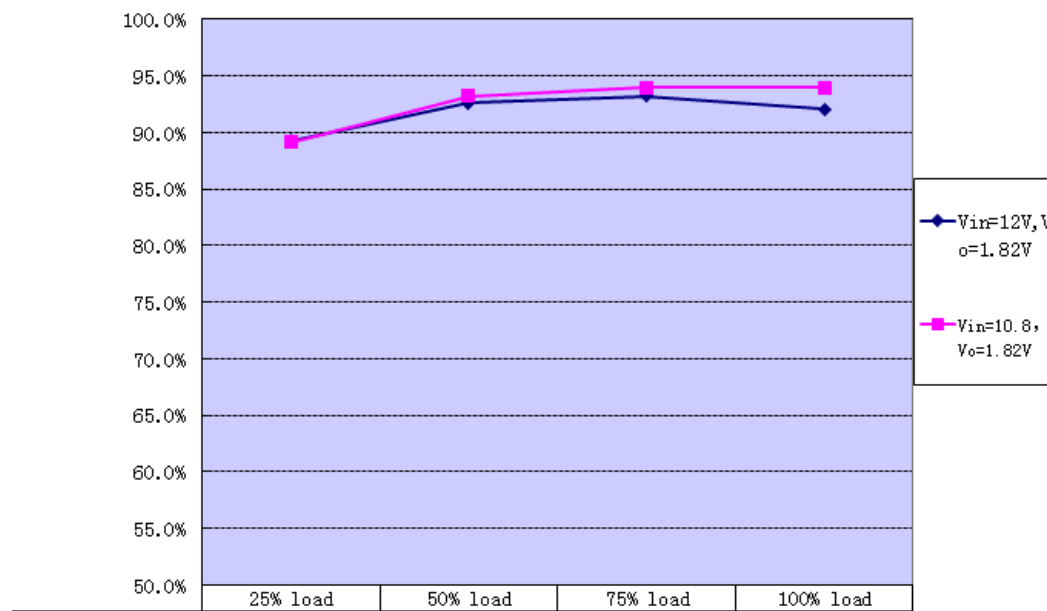
provide fast transient responses, low output capacitance, and good current sharing. The TPS53622/TPS53679 also provides a novel phase interleaving strategy and dynamic phase shifting for improved efficiency at different loads. Intel® VR13 can adjust the V_{CORE} slew rate and control voltage positioning. In addition, the TPS53622/TPS53679 supports the PMBus communications interface for reporting the telemetry results of voltage, current, power, temperature, and fault status to the system. All programmable parameters can be configured over the PMBus interface and stored in the NVM as new default values to minimize the number of external components.

12.7. Hard Drive Power

There are not individual power rail allocate for hard drive in RA-B6910-64C.

12.8. System VRM efficiency

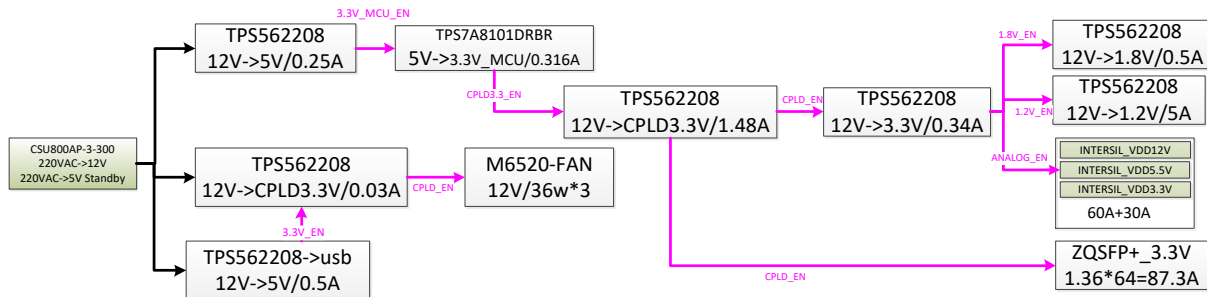
The following figure shows the conversion efficiency curve (12 V input, MOS+ capacitance) of the power block.



12.9. Power On

The power on sequence control mechanism is that using the power good signal forward to drive the power enable backward, the CPLD in CPU board will also control the power sequence in this system. In this case, the following picture shows the system power on sequence:

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12.10. High power use case

NA

13. Environmental and Regulations

Operating Temperature	32 to 104° F (0 to 40°C)
Storage Temperature	-40 to 158° F (-40 to 70°C)
Relative Humidity (Operating)	10% to 90% (non-condensing)
Relative Humidity (Storage)	5% to 95% (non-condensing)
Altitude (Operating)	0 to 1800 m
Altitude (Storage)	-500 to 5000 m

EMC	Emissions: FCC part15 Subpart B, EN55032, EN61000-3-2, EN61000-3-3 or EN61000-3-11, EN61000-3-12 (as applicable) Immunity: EN55035 Emissions and Immunity: EN300386
Safety	UL/CSA 62368, EN 62368, IEC 62368 CB Scheme with all country differences

14. Environmental Requirements

Following table shows the Standard Compliance that RA-B6910-64C meet:

EMC	Emissions : FCC, EN55032, EN61000-3-2, EN61000-3-3 or EN61000-3-11, EN61000-3-12 (as applicable) Immunity: EN55035 Emissions and Immunity: EN300 386
Safety	UL/CSA 62368, EN 62368, IEC 62368 CB Scheme with all country differences
Certifications	North America (NRTL) European Union (EU) BSMI (Taiwan) C-Tick (Australia) CCC (PRC) MSIP (Korea) EAC (Customs Union) VCCI (Japan)
European Union Directives	2006/95/EC Low Voltage Directive 2004/108/EC EMC Directive 2011/65/EU RoHS Directive

14.1. Vibration & Shock

Shock	NEBS GR-63-CORE_Issue3_2006	All products	For details, see the Cisco documentation. For details about the test conditions, see NEBS GR-63-CORE_Issue3_2006.
Collision	GB/T 2423.6	All products	For details, see GB/T 2423.6-1995.
Drop and overturn	GB/T 2423.7	Products with the gross weight	For details, see GB/T 2423.7-1995.

		greater than 75 kg	
Fall	Fall with package	Products with packages	For details, see NEBS GR-63-CORE_Issue3_2006.
Vibration	Random vibration with package		For details, see NEBS GR-63-CORE_Issue3_2006.
	Random vibration without package		For details, see requirements of the DI manufacturer.

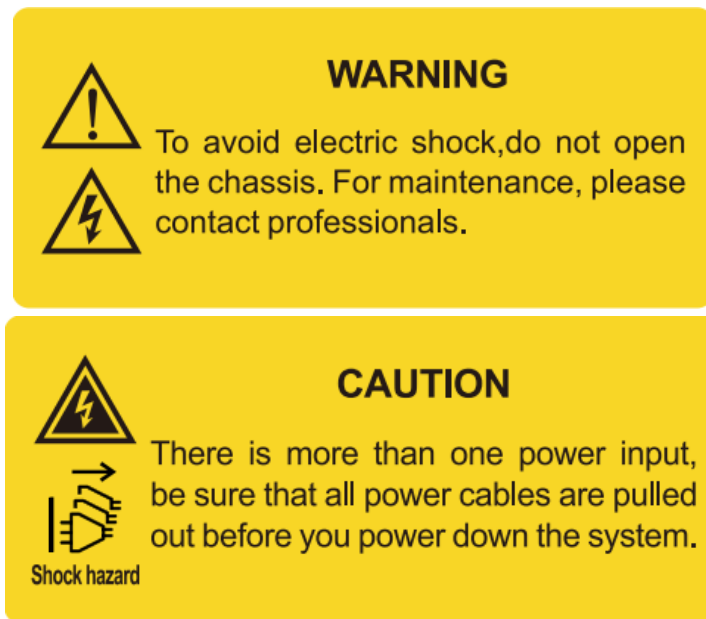
14.2. Regulations

NA

14.3. Labels and Markings

The following shows the labels and markings for RA-6910-64C





15. Prescribed Materials

15.1. Disallowed Components

15.2. Capacitors & Inductors

15.3. Component De-rating

16. Software Support

16.1. ONIE

The Open Network Install Environment (ONIE) is an open source initiative that defines an open “install environment” for bare metal network switches. ONIE enables a bare metal network switch ecosystem where end users have a choice among different network operating systems.

- install ONIE



select "Embed ONIE" to install ONIE OS

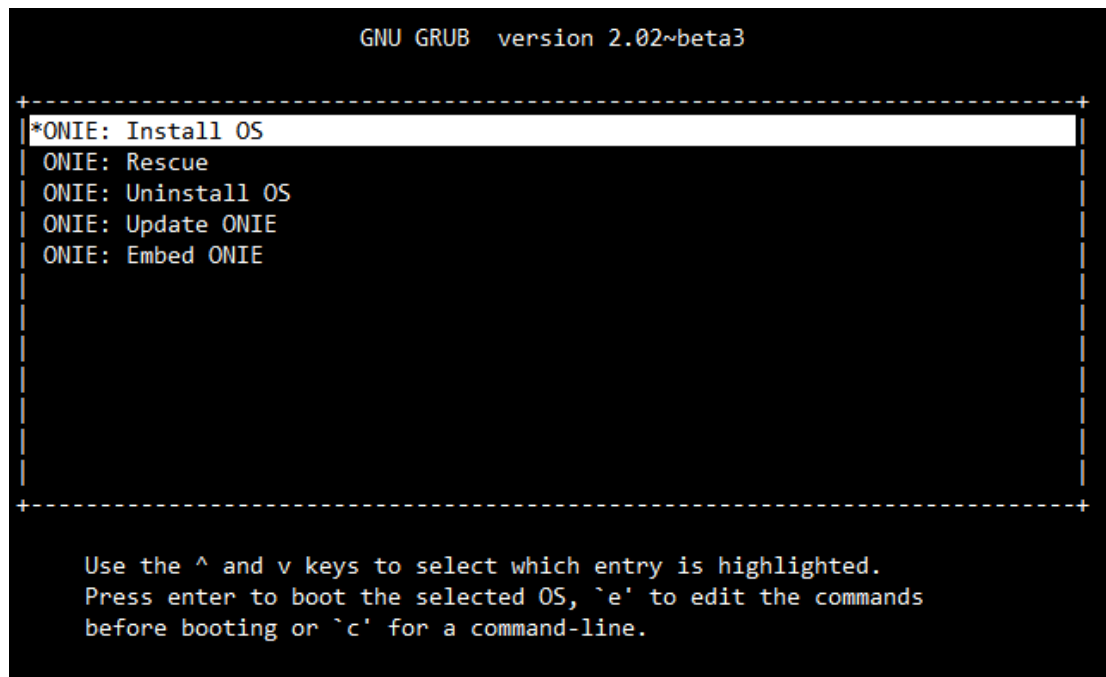
```

ONIE: Embedding ONIE ...
Platform   : x86_64-ragile_general-r0
Version    : 2018.02
Build Date : 2021-03-03T06:42+0000
Info: Mounting kernel filesystems... done.
Info: Mounting ONIE-BOOT on /mnt/onie-boot ...
usb 2-1: ep 0x81 - rounding interval to 128 microframes, ep desc says 255 microframes
usb 2-1: ep 0x2 - rounding interval to 128 microframes, ep desc says 255 microframes
Info: Mounting EFI System on /boot/efi ...
EEPROM device found.
eeprom_platform_name:ragile_ra-b6510-32c
image_build_machine_origin:ragile_general
Info: Using eth0 MAC address: 58:69:6c:fb:21:08
Info: eth0: Checking link... up.
Info: Trying DHCPv4 on interface: eth0
Warning: Unable to configure interface using DHCPv4: eth0
ONIE: Using link-local IPv4 addr: eth0: 169.254.154.241/16
Starting: klogd... done.
Starting: dropbear ssh daemon... done.
Starting: telnetd... done.
discover: ONIE embed mode detected. Running updater.
Starting: discover... done.

Please press Enter to activate this console. Info: eth0: Checking link... up.
Info: Trying DHCPv4 on interface: eth0
Warning: Unable to configure interface using DHCPv4: eth0
ONIE: Using link-local IPv4 addr: eth0: 169.254.14.203/16
ONIE: Starting ONIE Service Discovery
Info: Found static url: file:///lib/onie/onie-updater
ONIE: Executing installer: file:///lib/onie/onie-updater
Verifying image checksum ... OK.
Preparing image archive ... OK.
eeprom_platform_name:ragile_ra-b6510-32c
image_build_machine_origin:ragile_general
ONIE: Version      : 2018.02
ONIE: Architecture : x86_64
ONIE: Machine      : ragile_ra-b6510-32c
ONIE: Machine Rev  : 0
ONIE: Config Version: 1
ONIE: Build Date   : 2021-03-03T06:42+0000
Installing ONIE on: /dev/sda
ONIE: Success: Firmware update URL: file:///lib/onie/onie-updater
ONIE: Success: Firmware update version: 2018.02
ONIE: Rebooting...

```

- ONIE install SONiC



select “Install OS” to install SONiC bin

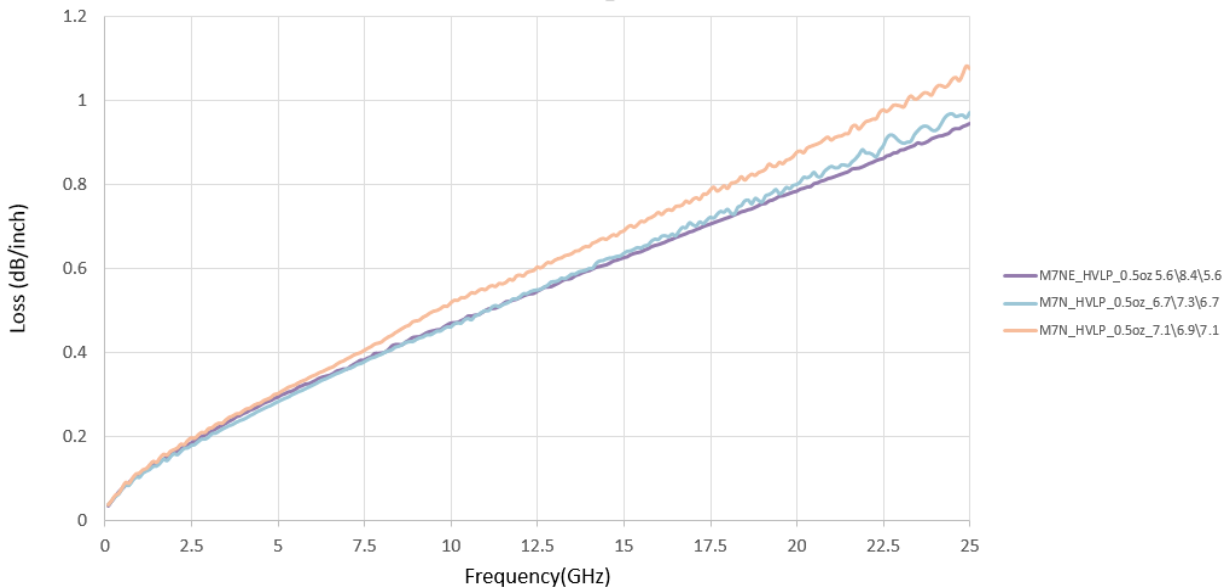
```

ONIE: / # onie-nos-install http://172.28.48.111/ngcf/output/xit-sonic-build/20191
1_0S1.OPJ4/broadcom_0_A_id202107120215001/broadcom_0S1.OPS4_08191203_install.bin
discover: installer mode detected.
Stopping: discover... done.
Info: Attempting http://172.28.48.111/ngcf/output/xit-sonic-build/201911_0S1.OPJ4/broadcom_0_A_id202107120215001/broadcom_0S1.OPS4_08191203_install.bin ...
Connecting to 172.28.48.111 (172.28.48.111:80)
installer 100% |*****| 669M 0:00:00 ETA
ONIE: Executing installer: http://172.28.48.111/ngcf/output/xit-sonic-build/201911_0S1.OPJ4/broadcom_0_A_id202107120215001/broadcom_0S1.OPS4_08191203_install.bin
Verifying image checksum ... OK.
Preparing image archive ... OK.
Installing SONiC in ONIE
ONIE Installer: platform: x86_64-broadcom-r0
onie_platform: x86_64-ragile_ra-b6510-32c-r0
Partition #1 is in use.
Partition #2 is in use.
Partition #3 is available
Creating new SONiC-OS partition /dev/sda3 ...
Could not create partition 3 from 788480 to 2148272127
Unable to set partition 3's name to 'SONiC-OS'!
Error encountered; not saving changes.
Warning: The first trial of creating partition failed, trying the largest aligned available block of sectors on the disk
Warning: The kernel is still using the old partition table.
The new table will be used at the next reboot.
The operation has completed successfully.
mke2fs 1.42.13 (17-May-2015)
Discarding device blocks: done
Creating filesystem with 58509201 4k blocks and 14630912 inodes
Filesystem UUID: fb1119c4-c4fa-49cf-b1a8-7563162de544
Superblock backups stored on blocks:
32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

Installing SONiC to /tmp/tmp.suYJpf/image-201911_ragile_master.0-0fab4ae
Archive: fs.zip
creating: boot/
inflating: boot/config-4.9.0-11-2-amd64
inflating: boot/initrd.img-4.9.0-11-2-amd64
inflating: boot/System.map-4.9.0-11-2-amd64
inflating: boot/vmlinuz-4.9.0-11-2-amd64
creating: platform/
creating: platform/x86_64-ragile_ra-b6920-4s-r0/
inflating: platform/x86_64-ragile_ra-b6920-4s-r0/platform-modules-ragile-ra-b6920-4s_1.0_amd64.deb
creating: platform/x86_64-grub/
inflating: platform/x86_64-grub/grub-pc-bin_2.02~beta3-5+deb9u2_amd64.deb

```

17. System Firmware

17.1. BIOS

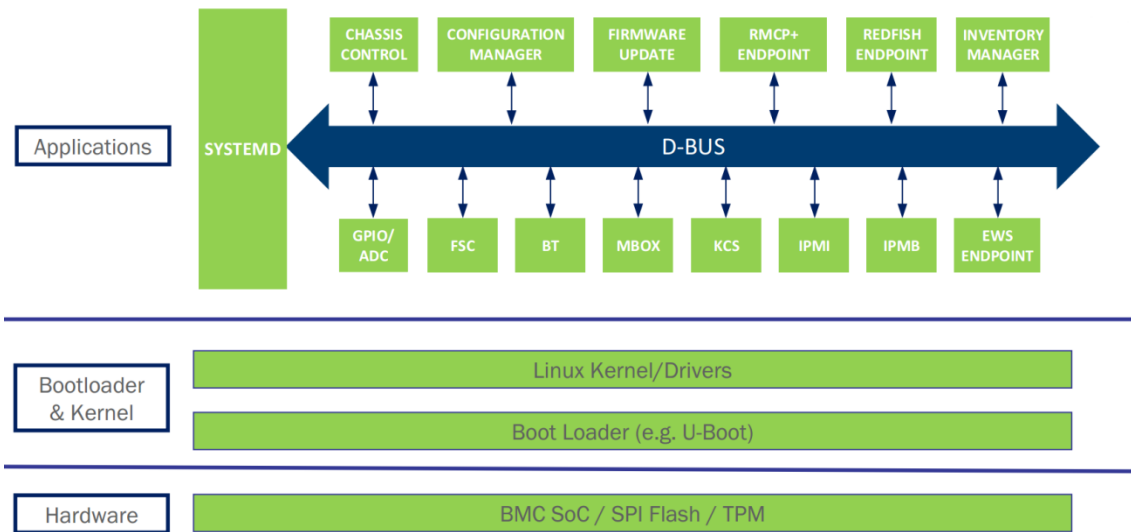
Provided by AMI Company, our BIOS comply with UEFI 2.6, support basic BIOS function, and provide the ability to configure BIOS settings via setup options. Two BIOS flash ROMs are installed on device, and each flash's capacity is 16MB. If one start failed, the other will take effect instead automatically.

18. Hardware Management

18.1 BMC

BMC (Baseboard Manager Controller) is a platform manager system that can interact with HOST OS and BIOS to play the role of platform management. It is independent and does not depend on other hardware (such as CPU, memory, etc.) or other OS (such as HOST OS, BIOS, etc.), which means BMC can still work when all other OS crashed.

- BMC features list:
 - Power Management (power CPU off/on/cycle; BMC reset cold/reset warm)
 - User Interface (IPMI commands; Linux ssh; Console login)
 - System Event log
 - Firmware Update (BIOS、BMC)
- OpenBMC Arch



Appendix A - Requirements for IC Approval

Requirements	Details	Link to which Section in Spec
Contribution License Agreement	OCP CLA	Link to Sec 1
Are All Contributors listed in Sec 1: License?	Yes	
Which 3 of the 4 OCP Tenets are supported by this Spec?	Openness Efficiency Scale	For detailed description, see Sec 2.
Is there a Supplier(s) that is building a product based on this Spec?	Yes	Ragile Networks Inc. Here is the link: http://www.ragilenetworks.com/products/100G/RA-B6910-64C
Will Supplier(s) have the product available for GENERAL AVAILABILITY within 120 days?	Yes	Please see Appendix B.

Appendix B - OCP Supplier Information (to be provided by the Supplier of Product within 120 days)

Company: Ragile Networks Inc.

Contact Info:

Email: info@ragilenetworks.com

Phone: 1-4087729724

Product Name: RA-B6910-64C

Product SKU#: NA

Description: For more details, please visit the official website below:

<http://www.ragilenetworks.com/>

Requirements	Details	Links
Which Product recognition?	OCP Accepted™	
If OCP Accepted™, who provided the Design Package?	Ragile Networks Inc.	
2021 Supplier Requirements for your product(s)	Ragile Networks Inc.	http://www.ragilenetworks.com/