Agema AG7648C L3 Switch Specification

Revision.01

Agema Systems Inc.

Fremont CA

AG7648C Hardware Specification

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AG7648C Hardware Specification

1. Revision History

Rev	Date	Description	Page	Editor
0.1	2-Sep-2016	Initial draft		**Anson.Shen**

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Agema Systems, Inc.

3. Overview

The AG7648C platform support up to 720Gbps switching bandwidth as below

1. AG7648C
   ➢ 48 port x 10G BT and 6 x 40G QSFP+.

Feature

- External Serial Rs232 ports (one RJ45 type, one micro USB type).
- Support one USB-A type for storage
- 48 x 10Gbps ports for RJ45.
- 6 x 40Gbps ports for QSFP+ transceiver.
- One management port support 10M/100M/1G speeds
- Front panel LED display for System, Locator, and FAN and power status indicates.
- High performance CPU system with large memory. Rangeley C2338/2GB DDRIII RAM.
- Software readable thermal monitor.
- RTC time clock support.
- Hot plugging redundant power supply.
- Current monitoring for Power management.
- FAN removable and monitoring.
- Standard 1U chassis high

4. Hardware Functionality

4.1. Block Diagram

AG7648C 48 X 10G BT & 6 x 40G QSFP+
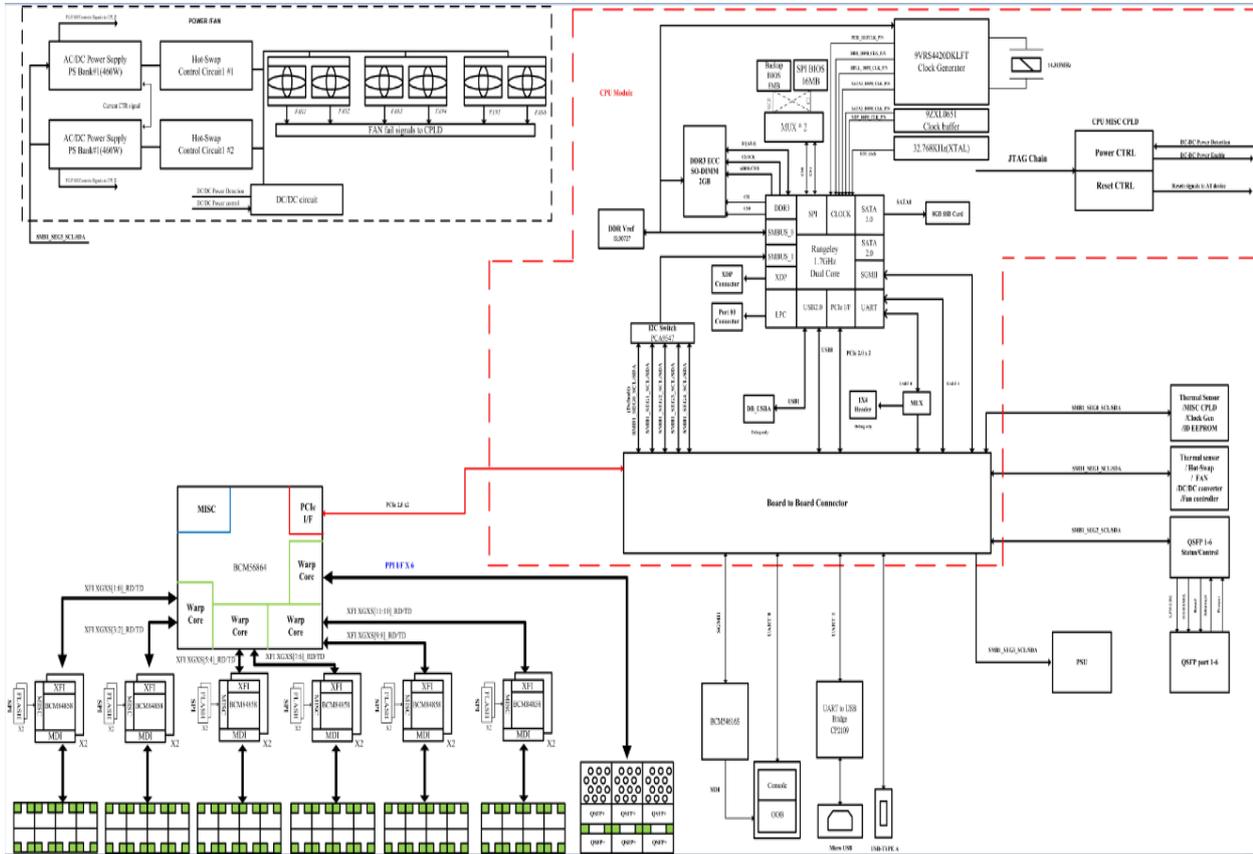
4.2. CPU Subsystem
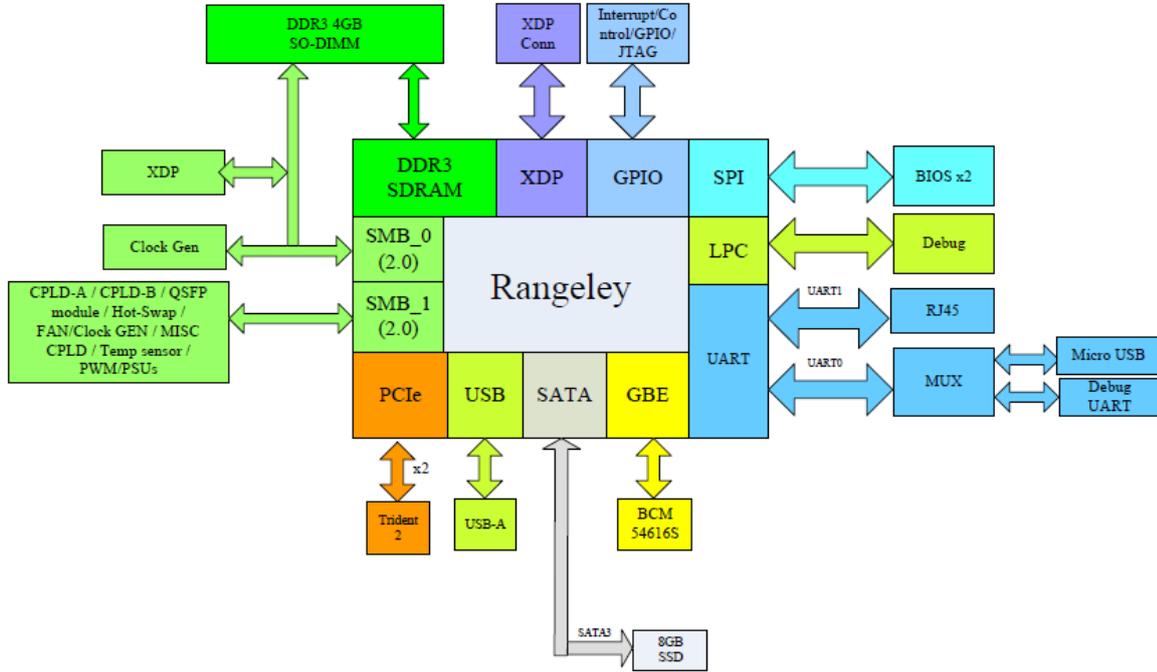
4.3. LED Definition for System

System LEDs indications including System, PSU, and FAN Status

Feature	Detailed Description	Comment
System LED	Solid green – All OK, CLI prompt available Blinking green – Boot-up in progress Solid yellow – Major Fault. Displays summary of all major faults within the system; the faults are traffic affecting. Blinking yellow – Minor Fault: Displays summary of all minor faults within the system; the faults are not traffic affecting.	At front side
FAN LED	Solid green –fan powered and @expected rpm Solid yellow –fan failed including incompatible airflow direction from what is indicated in the Board ID for the particular SKU.	At front side
POWER LED	Solid green – The DC output is on and OK . Solid yellow– Power supply critical event causing a shutdown; failure, OCP, OVP, Fan Fail, OTP,UVP . Blinking yellow–Power supply warning events where the power supply continues to operate; high temp (PMBus reading inlet > 60deg; PMBus reading hotspot > 100deg), high power, high current (105 %*), slow fan.	At the rear side
LOCATED LED	Off – No power . Blinking Blue – locator function is enabled Solid Blue – locator function" is disabled	At front side

Note : For FAN LED , when one of FAN LEDs on the rear side failed , fan led on the front panel will display yellow ,

QSFP+ port LEDs

Feature	Detailed Description	Comment
Link/ACT LED	■ Off – No Link ■ Solid green – Link on 40G speed ■ Solid Amber- Link on 10G speed ■ Blinking green – 40G speed ,transmit/Receive is activity ■ Blinking amber – 10G speed ,transmit/Receive is activity	

10GBT port LEDs

Feature	Detailed Description	Comment
Link LED	■ Off – No Link ■ Solid green – Link on 10G speed ■ Solid yellow – Link on 1G/100M speed	
Activity	■ Off – No Link ■ Blinking green – Transmit/Receive is activity	

Front Management Ethernet port LEDs

Feature	Detailed Description	Comment
Link LED	■ Off – No Link ■ Solid green – Link on 1G speed ■ Solid yellow – Link on 10M/100M speed	
Activity	■ Off – No Link ■ Blinking green – Transmit/Receive is activity	

4.4. Pluggable Power Supply & Fan Tray

4.4.1.1.   Power Supply & Fan Tray allocation
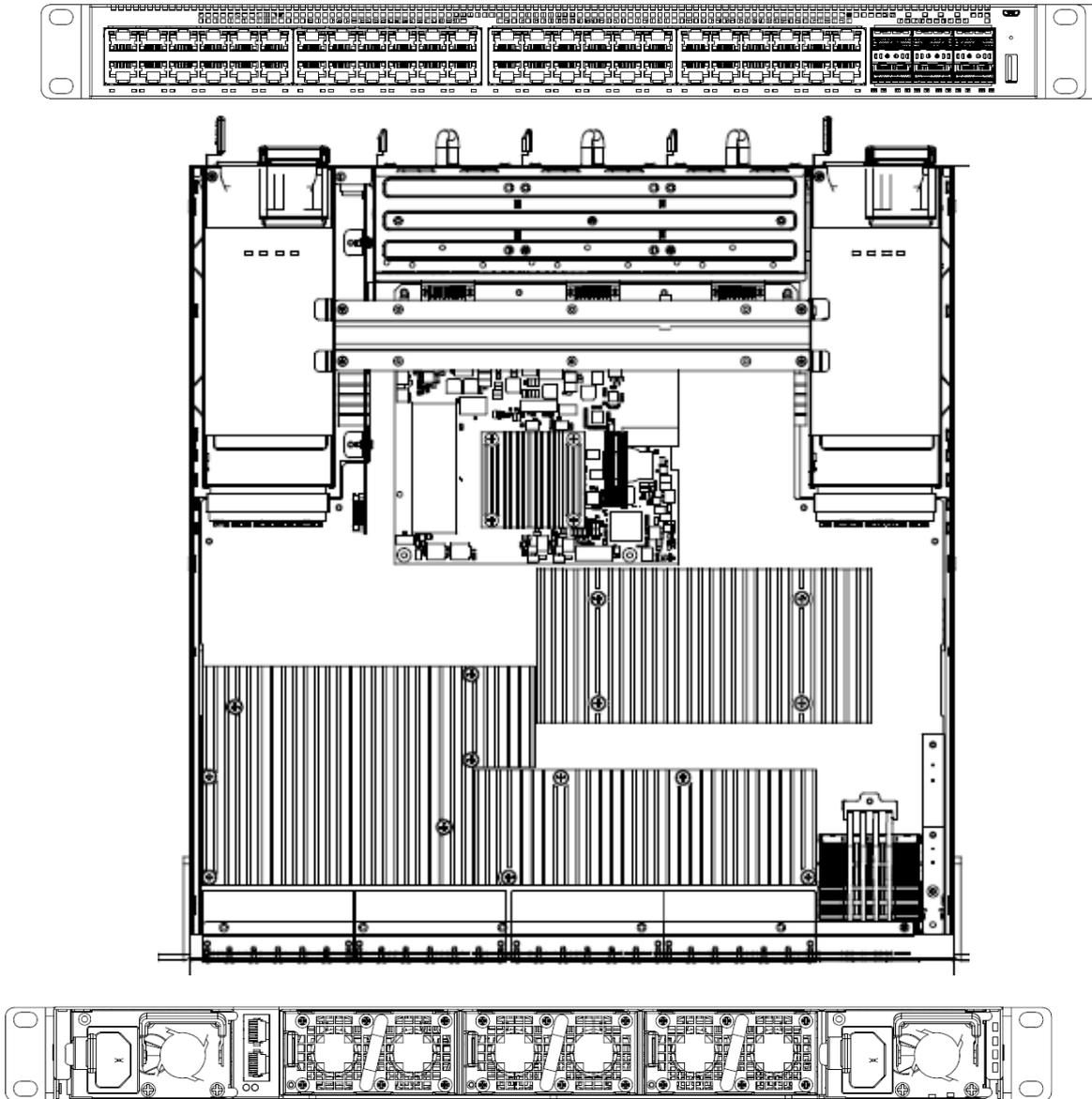
4.5. AC Power Supply

The power supply, having a universal input (90 VAC to 264 VAC) and 12 VDC regulated output. This regulated output supply power to other power supply backup source. The power supply shall incorporate over current protection and OVP.

- **Input Voltage**

    90 to 264 VAC, universal input. Nominal input voltage: 100 to 240VAC.

- **Input Frequency Range**

    47 to 63 Hz.

- **Output Voltage and Current**

Output	Nominal Output Voltage Set Point	Set Point Tolerance	Total Error Band	Minimum Current	Maximum Current
1	12 VDC	+/- 0.5%	+/- 2%	0 Amp	38 Amp

- **DC Output Connector**

    The below table is PSU pin define on Power Supply Slot (on Main Board)

Pin	Name	Pin	Name
A1-A9	GND	B1-B9	GND
A10-A18	+12V	B10-B18	+12V
A19	PMBus SDA	B19	A0 (SMBus address)
A20	PMBus SCL	B20	NA
A21	PSON	B21	12VSB
A22	SMBAlert#	B22	Smart on
A23	Return Sense	B23	12V load share bus
A24	+12V remote	B24	No Connect
A25	PWOK	B25	NA
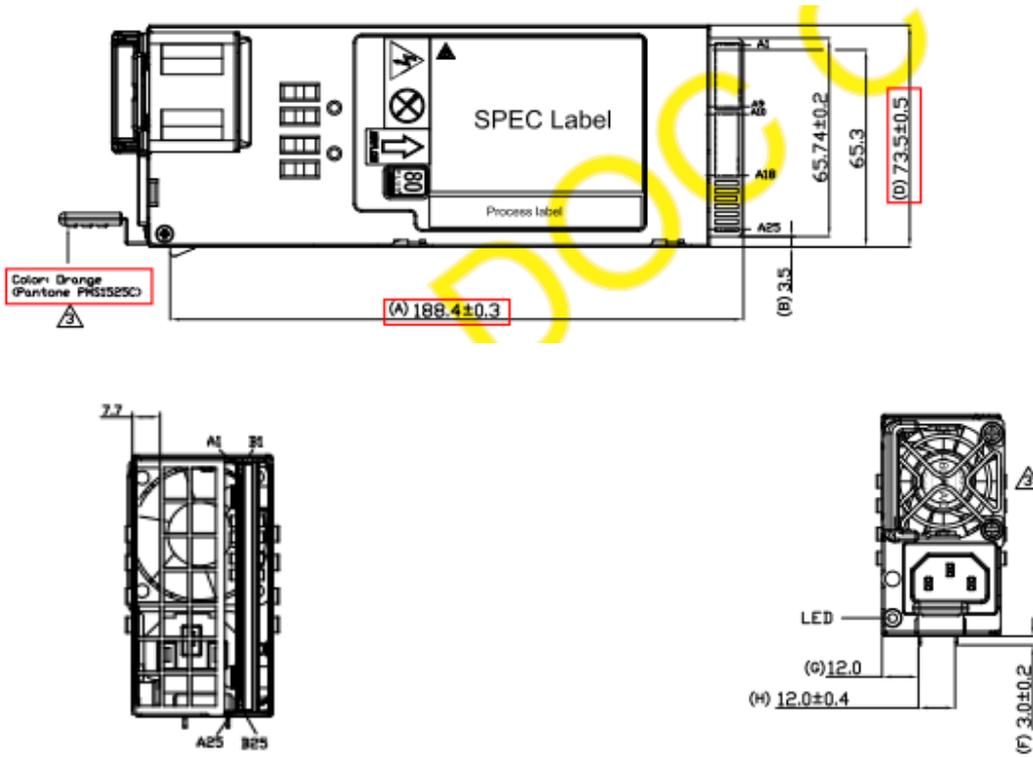
4.6. Fan Specification

Description	Manufacturer	Part number
Air flow : Front to Back	Delta Electronics	FFB03612EHN
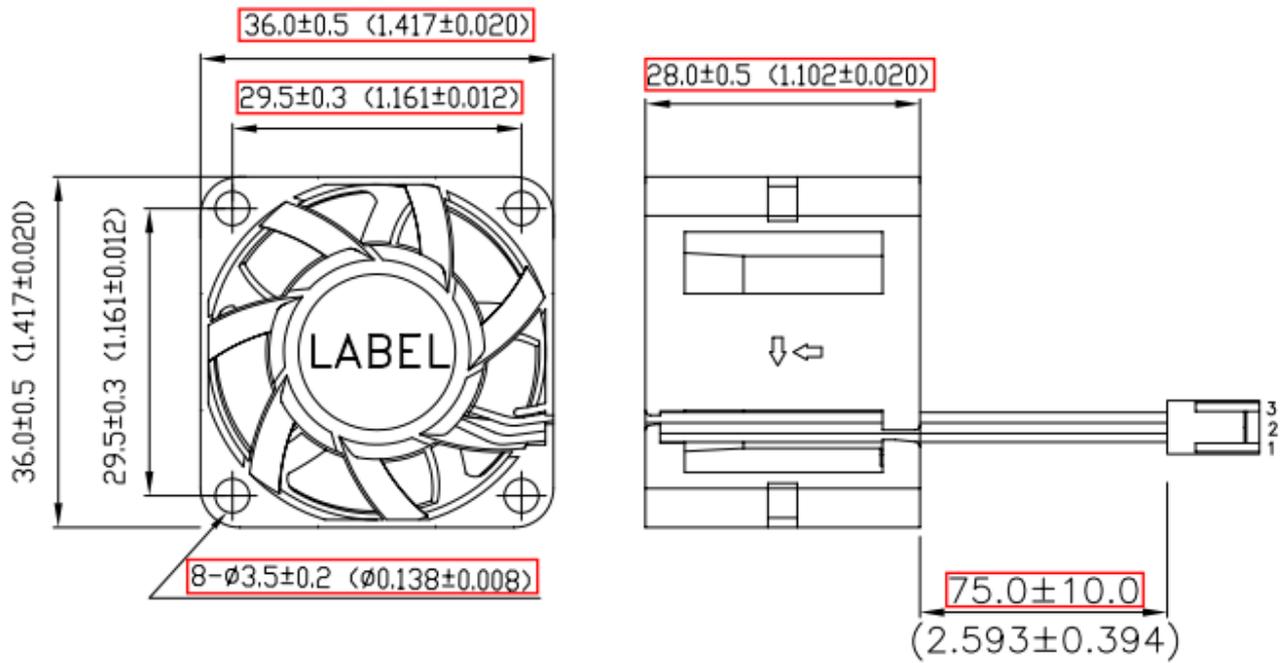
### 4.7. Mechanical

Mechanical dimension
438.5*460*43.5 mm
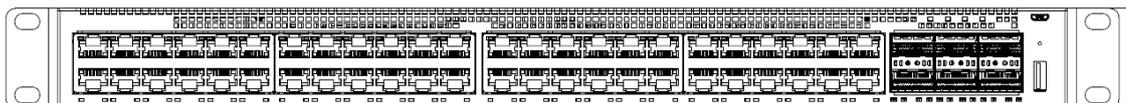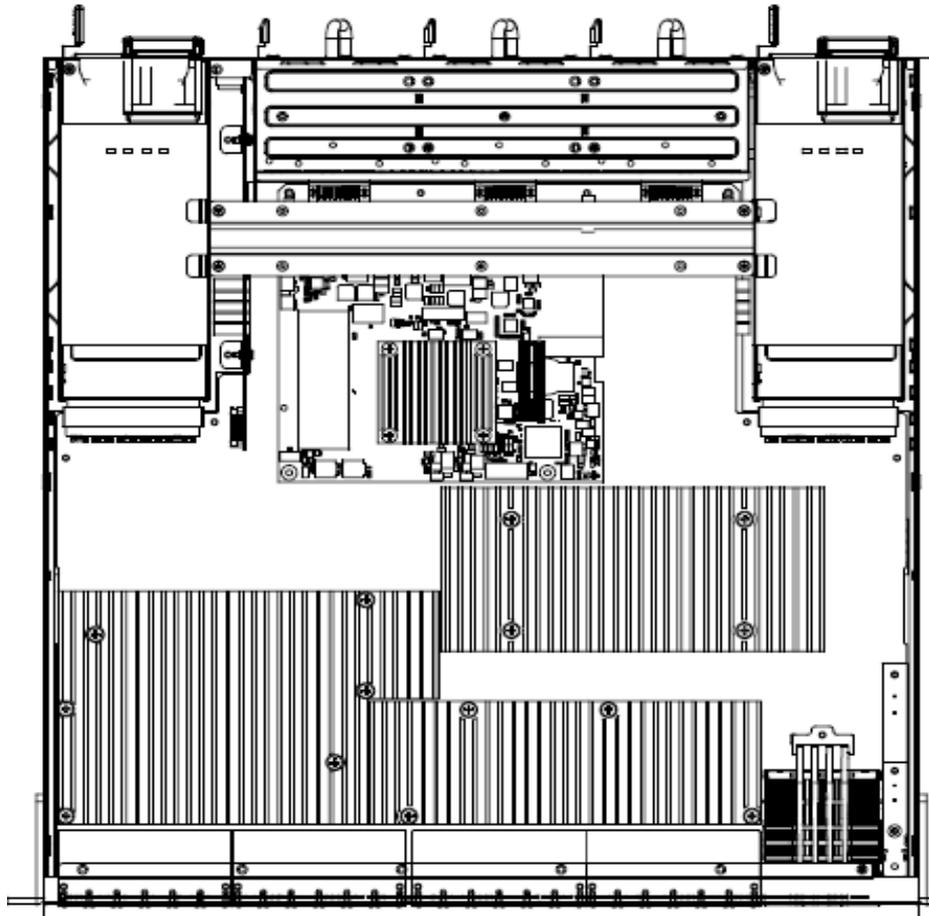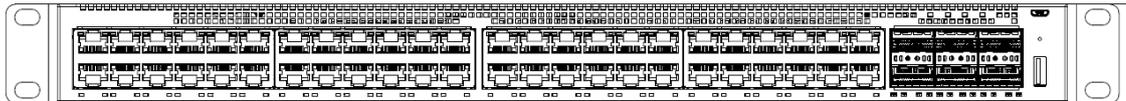
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4.8. Faceplate layout and artwork
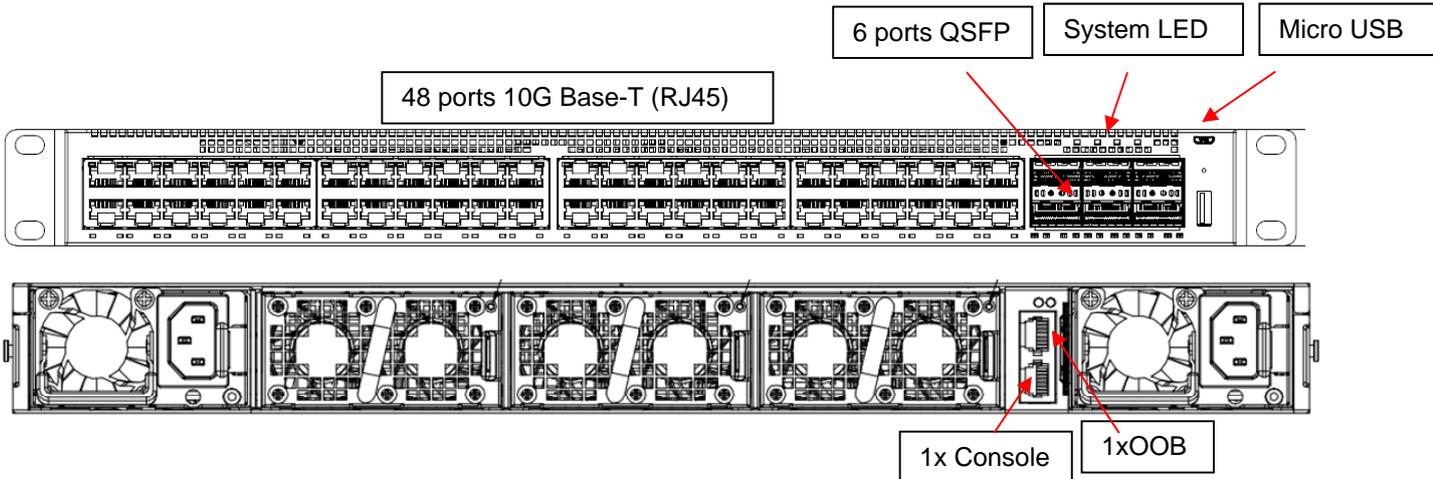
The front panel views for main key Components of AG7648C
48x 10G Copper ports (RJ45)
6x 40G fiber ports
System LEDs (System/Fan/Locator /PWR)
1x USB-Type-A
1x Micru-USB

The rear panel views for main key Components of AG7648C
1x OOB port (RJ45)
1x Console port (RJ45)
3x Fan Tray module

4.9. Mechanical Assembly
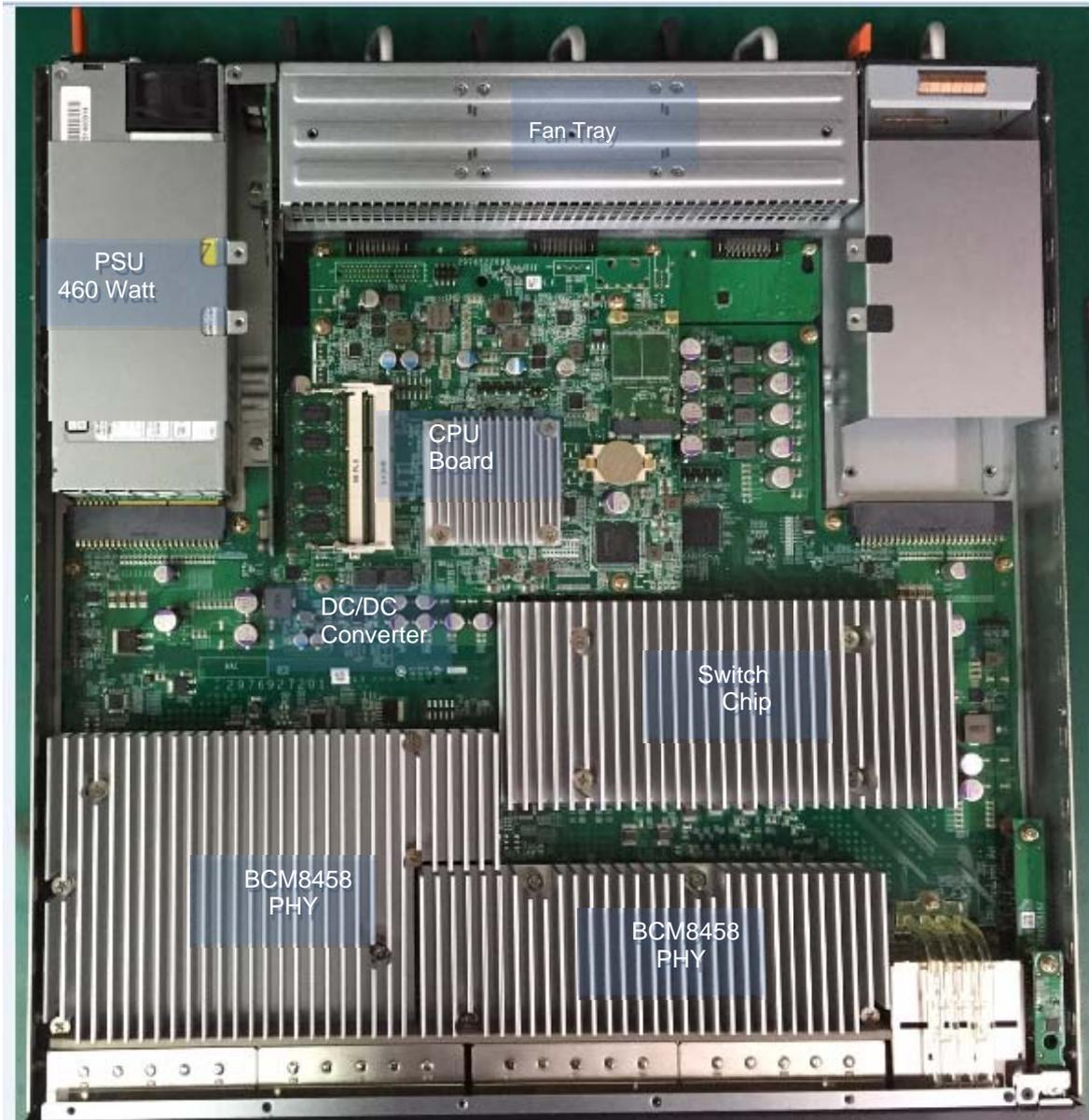
4.10. PCB board outlook

➢ **CPU board**
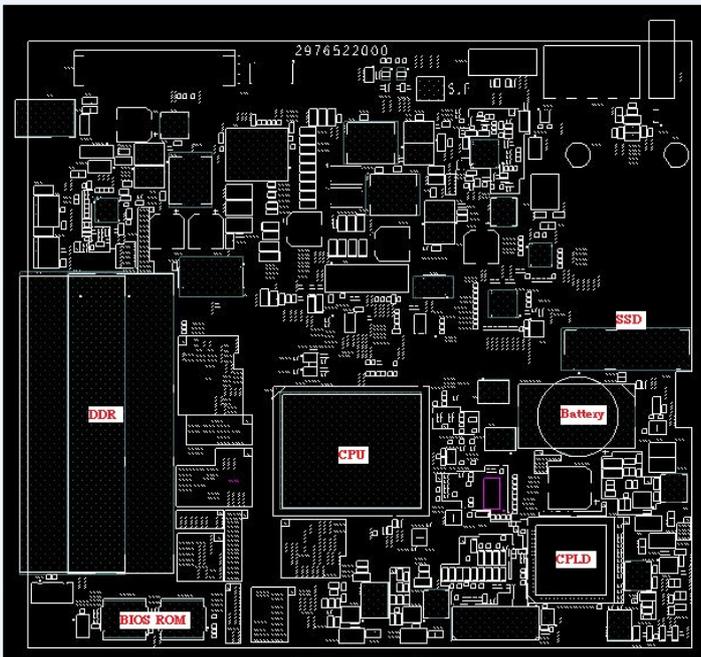
➢ **Fan board**

➢ **Daughter board**
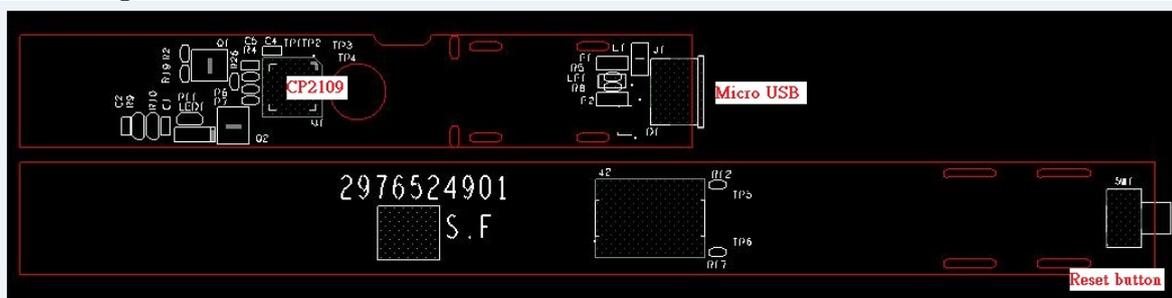
> Main board
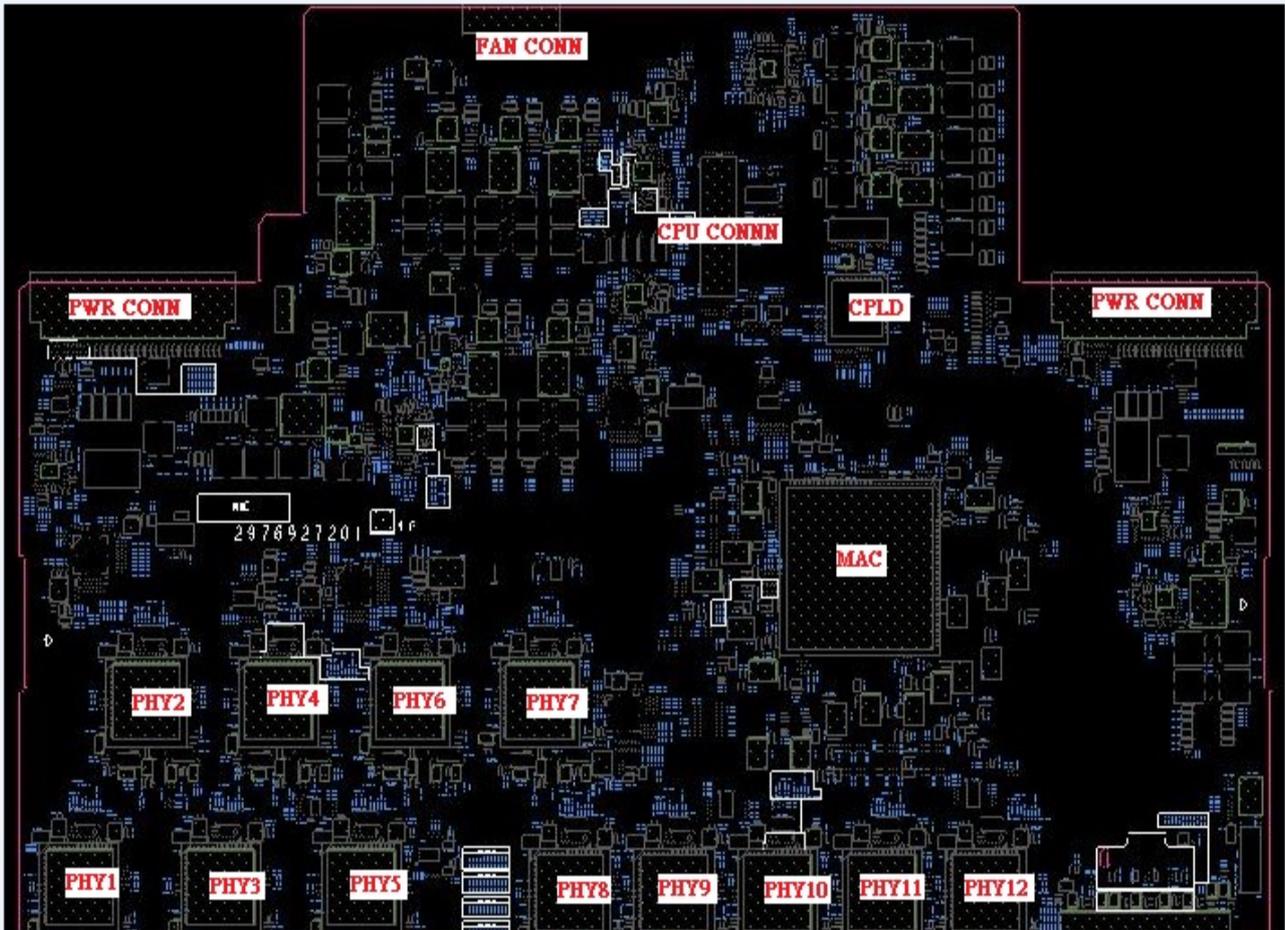
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4.11. Stackup

➢ CPU board

Material：IT-180A

Layer	Layer type		Material requirement	Thickness requirement	GCE stackup	Thickness
	Layer	**Type**				(mil)
					solder mask	0.50
1	L1	TOP			0.5oz+plating	2.10
					1*1080 65%	2.78
2	L2	G			1 oz	1.25
					10 mil core(2*2116)	10.00
3	L3	S			1 oz	1.25
					1*106 71.5%+1*106 75%	3.19
4	L4	G			1 oz	1.25
					3 mil core(1*1086)	3.00
5	L5	S			1 oz	1.25
					2*2116 60%	10.54
6	L6	S			1 oz	1.25
					3 mil core(1*1086)	3.00
7	L7	G			1 oz	1.25
					1*106 71.5%+1*106 75%	3.19
8	L8	S			1 oz	1.25
					10 mil core(2*2116)	10.00
9	L9	G			1 oz	1.25
					1*1080 65%	2.78
10	L10	BOTTOM			0.5oz+plating	2.10
	solder mask				solder mask	0.50
		Total Thickness	63			62.69
		(without soldermask)				1.592273

➢ FAN board

4-Layer Board Stack-Up

Layer Name	Layer Description	Material GW4011
	Solder Mask	Solder Mask
Signal 1	SIGNAL	Copper
	GW4011 PP 1080 RC 63%	FR4
Plane 2	GND	Copper
	CORE 1.3MM1/1OZ	FR4
Plane 3	PWR	Copper
	GW4011 PP 1080 RC 63%	FR4
Signal 4	SIGNAL	Copper
	Solder Mask	Solder Mask
Overall Board Thickness : 1.6MM+/-10 %		

➢   Daughter board
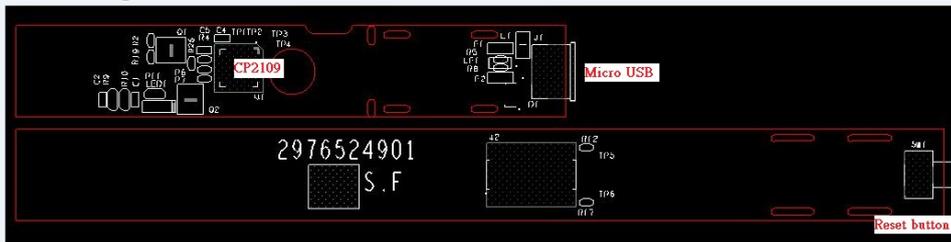
➢   Main board

Structure (Stack up)					
Layer	Type	Cu	Thk (mil)	Design	Thk (mil)
	solder mask			solder mask	0.50
1		0.5 oz+plating		0.5 oz+plating	2.10
	prepreg		4	3313 59%	4.03
2		0.5 oz		0.5 oz	0.66
	core		8	5mil core(2116) + VLP2	4.88
3		0.5 oz		0.5 oz	0.66
	prepreg		5.1	2*3313 59%	7.95
4		0.5 oz		0.5 oz	0.66
	core		8	5mil core(2116) + VLP2	4.88
5		0.5 oz		0.5 oz	0.66
	prepreg		5.1	2*3313 59%	7.80
6		1 oz		1 oz	1.25
	core		4	4mil core(3313) RTF	4.00
7		2 oz		2 oz	2.61
	prepreg		7	2*1080 69%	5.60
8		2 oz		2 oz	2.61
	core		4	4mil core(3313) RTF	4.00
9		1 oz		1 oz	1.25
	prepreg		5.1	2*3313 59%	7.80
10		0.5 oz		0.5 oz	0.66
	core		8	5mil core(2116) + VLP2	4.88
11		0.5 oz		0.5 oz	0.66
	prepreg		5.1	2*3313 59%	7.95
12		0.5 oz		0.5 oz	0.66
	core		8	5mil core(2116) + VLP2	4.88
13		0.5 oz		0.5 oz	0.66
	prepreg		4	3313 59%	4.03
14		0.5 oz+plating		0.5 oz+plating	2.10
	solder mask			solder mask	0.50
	Board thickness:		90.6±9.1	Total:	90.87

5. Software Support

AG7648C supports ONIE

6. Critical Components

Description	Manufacturer	Part number
IC ETH SW 72P+18P 10GB+40GB	Broadcom	BCMM56854A2IFSBG
I IC ETH X'CEIVER 4P 10GB	Broadcom	BCM84858RB1KFEBG
IC ETH X'CEIVER 10/100/GB-T	Broadcom	BCM54616SC0KFBG
PHONE JACK LF 12P8C 6*2	Delta	RCTG-12A201T-R
IC INT-PRO 1.7GHz	Intel	FH8065501516761
DDR3 SO-DIMM 4GB 800MHz	Apacer	76.B390G.C5Z0C
Power Supply Unit (PSU)	Delta	DPS-460KB series
Fans	Delta	FFB03612EHN-9T13

7.   PCB board outlook

➢   **CPU module , TOP view**
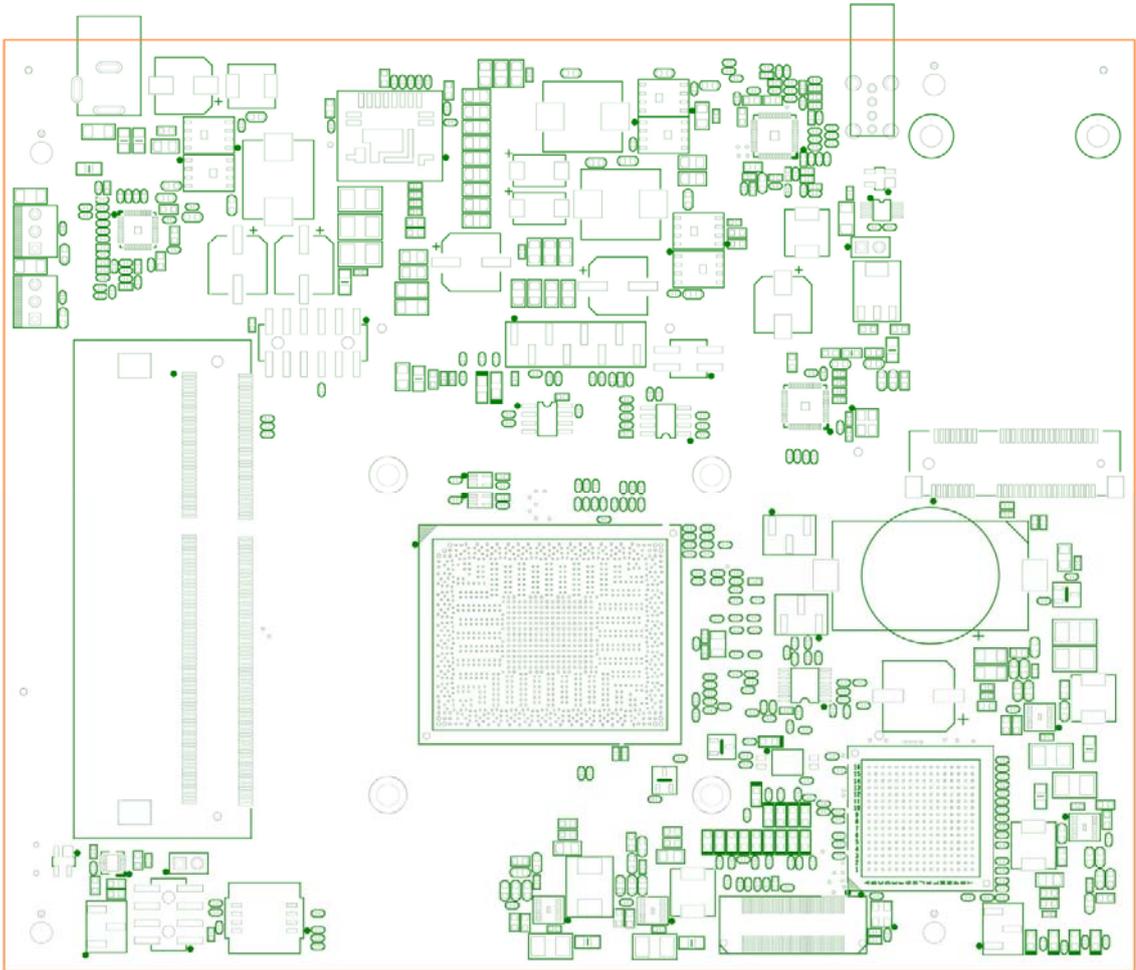
➢ **CPU module , Bottom view**

SILKSCREEN BOTTOM

➢ **Main board , TOP view**
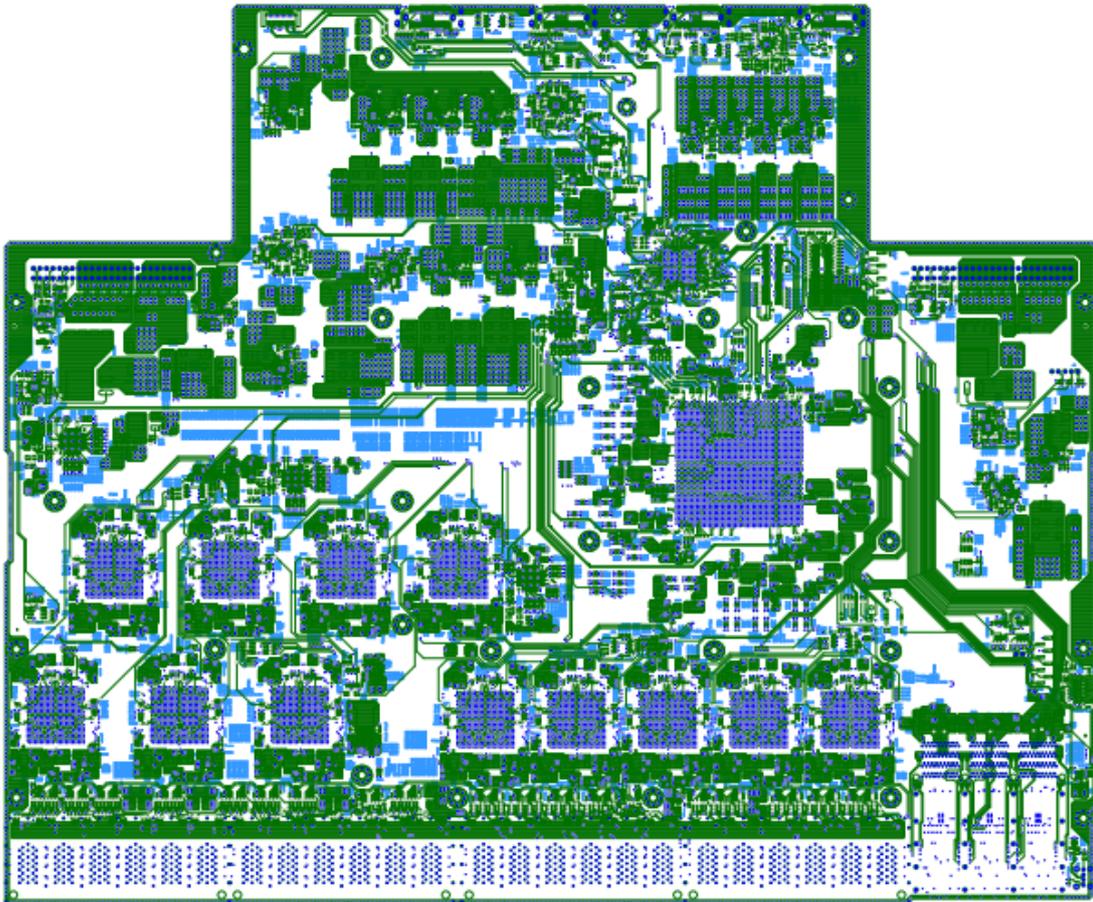
➢ **Main board , Bottom view**
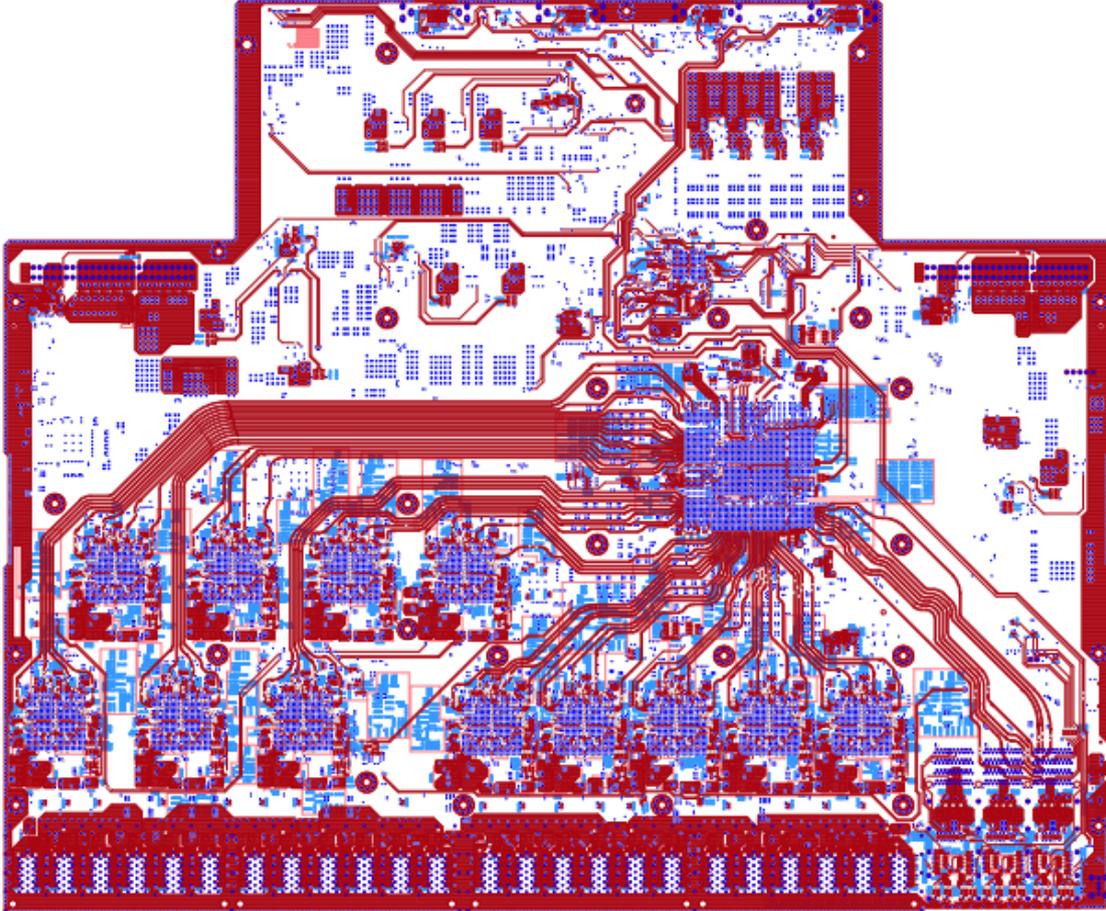
8. Technical Specs and Environmental Requirements

Technical Specifications

Network Protocol and Standards Compatibility
IEEE802.3 CSMA/CD
IEEE802.3u 100BaseTx
IEEE802.3z 1000BaseSX
IEEE802.3z/ab 1000BaseT
IEEE802.3an 10GBase-T
IEEE802.3af/at
SFF-8341
SFF-8436
IEEE802.3x flow control

Interface
USB connector (USB to DB9)

Physical Dimensions
438.5 x 460 x 43.5 mm (W x D x H)
17.26 x 18.11 x 1.71 inch

Electromagnetic Emission

■   FCC Class A, CE Class A, VCCI Class A

Safety Agency approval

■   UL, CUL