

OPEN

Compute Project

Agema AG6248C-PoE Switch Specifications

Revision .01

Agema Systems Inc.

Fremont CA

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1. Revision History

Rev	Date	Description	Page	Editor
0.0	07/27/2015	Initial draft		Roger.Chao
0.01	03/04/2016	Add Licenses section and describe optional second PSU	4 & 10	Bob Lee / Robert Zhu
0.02	04/09/2016	Add PoE power allocation table Add PoE daughter board view, Add OEM name of DC to DC module	10 & 19, 20	Roger Chao

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Agema Systems, Inc.

3. Scope

This document defines the technical specification for the Agema AG6248C-PoE switch submitted to the Open Compute Project Agema Open Platform Switch

Overview

AG6248C is a low cost managed Ethernet switch that is embedded with forty eight 1G Ethernet copper port that could support PoE+/UPOE, includes port number 1 to port 12 may support of a maximum of 60 watts per UPOE port. All 48 PoE ports supports IEEE802.3af which could output max 30 watts per port. In addition to two 10G uplink SFP+ and 2x SFP combo ports, AG6248C-PoE has 900 watts lump sum PoE power budget quota for each PSU.

For the purpose of reducing customer OPEX and CAPEX, it provides two optional specs of either without or with the fashion of 1+1 redundancy swappable power supply units (PSU) to increase the energy efficiency. PSU for end customers, one is 1100W single PSU, while another choice is double 1100W PSU which will contribute to enhanced PoE switch applications with 1+1 protection.

The key performance features not only are functioning as a high bandwidth fabric switch, but also covering all traditional PoE power management functions to efficiently budget the power consumption by actual demand. All of PoE copper ports have sensing capabilities which prevent PD's disconnection, and provide PD protections such as over-load, under-load, over-voltage, over-temperature, short-circuiting.

AG6248C-PoE is compatible to almost all PoE devices, such as wireless AP, security camera and VoIP Phones, etc., even those pre-standard devices.

AG6248C-PoE is a fully manageable Layer 3 Ethernet switch pre-loaded with ONIE.

Features

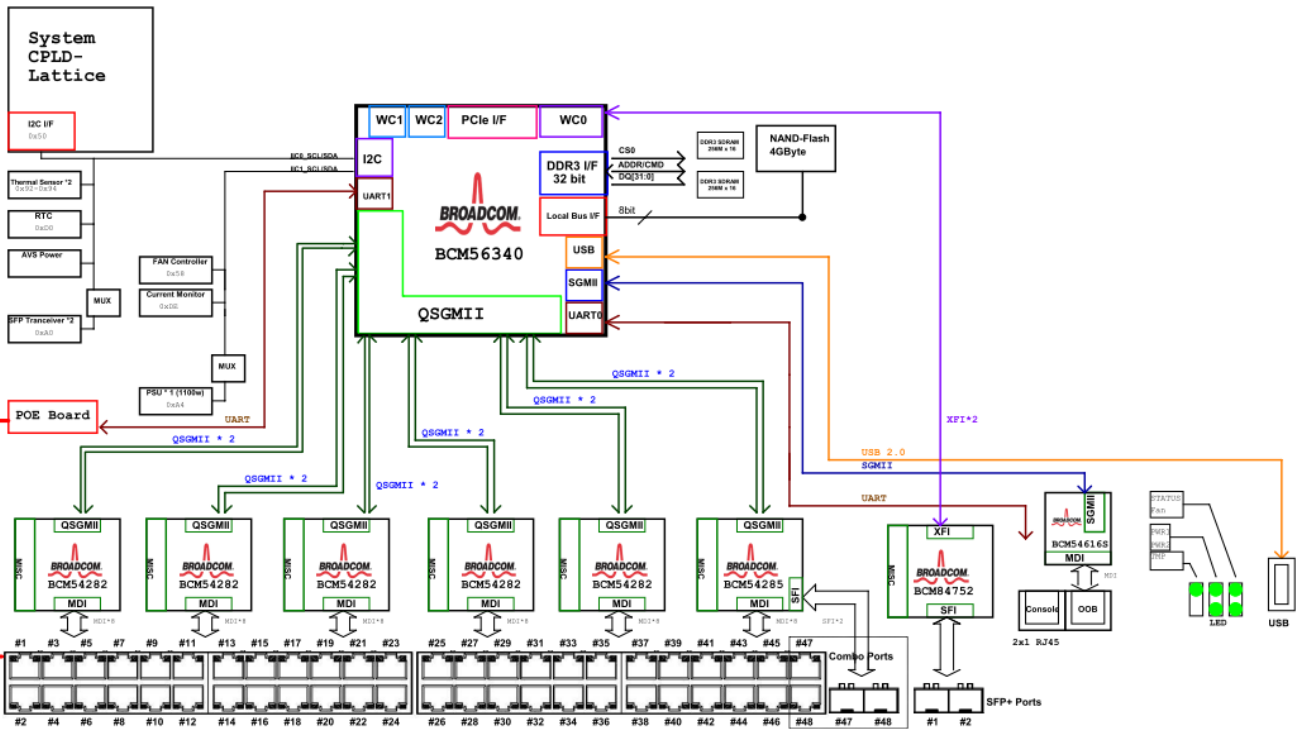
- External Serial RS232 port (RJ45)
- Support one USB port (type-A) for system file access
- 48 1Gbps copper ports(RJ45)
- Two combo 1Gbps SFP fiber ports
- Two 10Gbps SFP+ fiber ports
- The Front panel Management copper port RJ45 (OOB) support 10M/100M/1G speeds
- 48x1G copper ports (RJ45) support PoE+ (IEEE802.3af/at)
- AG6248C-POE, port number 1-12 of RJ45 ports support UPoE capability
- Front panel LED display for system status, Fan, TEMP and power (PSUs) status
- Integrated Dual Core ARM Cortex A9 IC with large memory. 4GB NAND, 1GB/DDR3 SDRAM
- Temperature monitoring. (TMP75).
- For AG6248C-POE platform, there is hot pluggable Fan tray. And Fans' speeds can be monitored and controlled by Fan controller.
- Standard 1U chassis high

AG6248C-POE series configuration table

Description	AG6248C-POE
PSU	1100Wx1, expandable to 1100Wx2
MAC feature	BCM56340
Ethernet PHY	BCM54282*5, BCM54285*1, BCM84752*1
PHY (OOB Port)	BCM54616s
PoE controller	PD69100*1
8 ports PSE PoE manager	PD69108ILQ*8

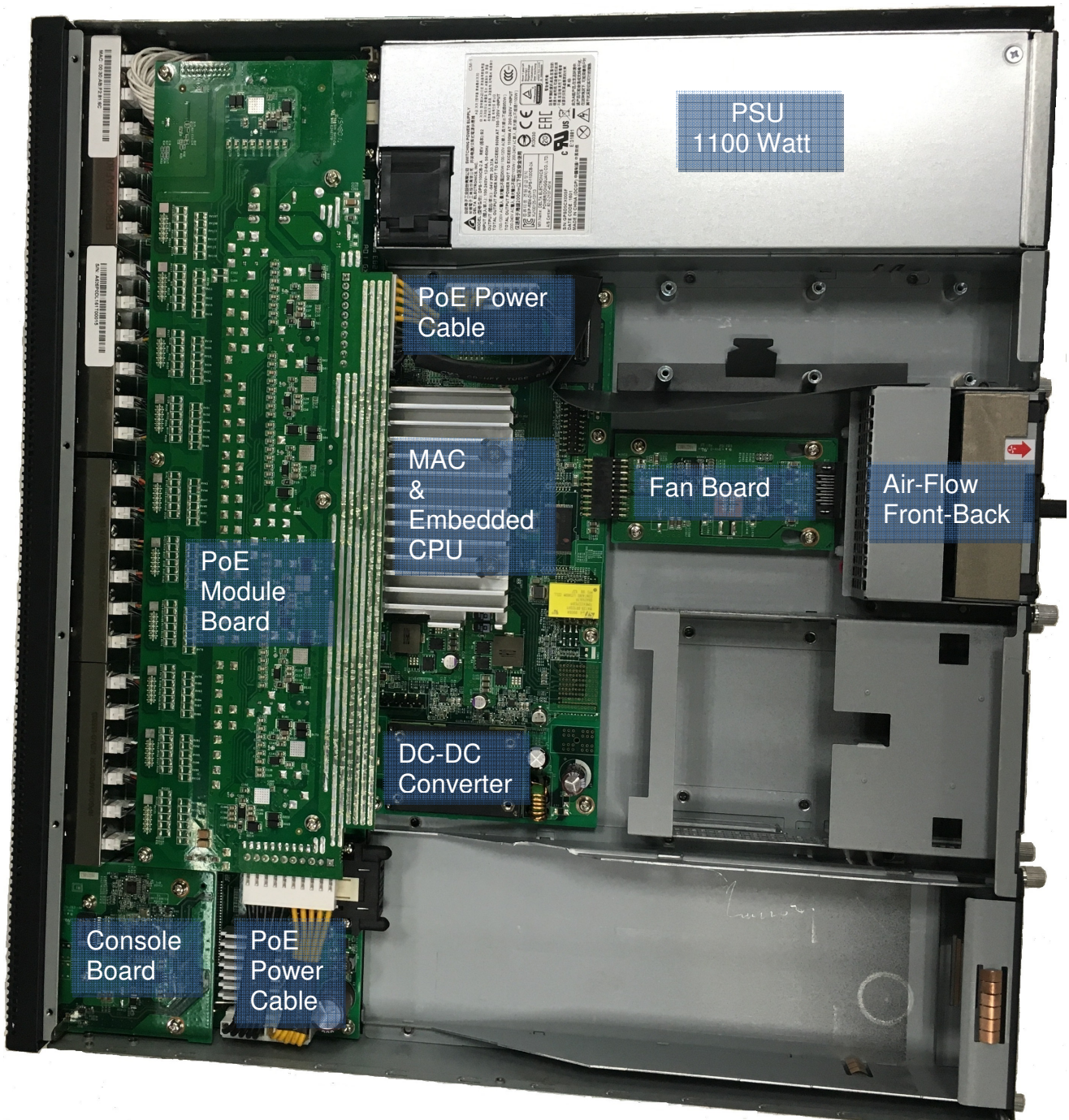
4. Hardware Functionality

4.1. Block Diagram

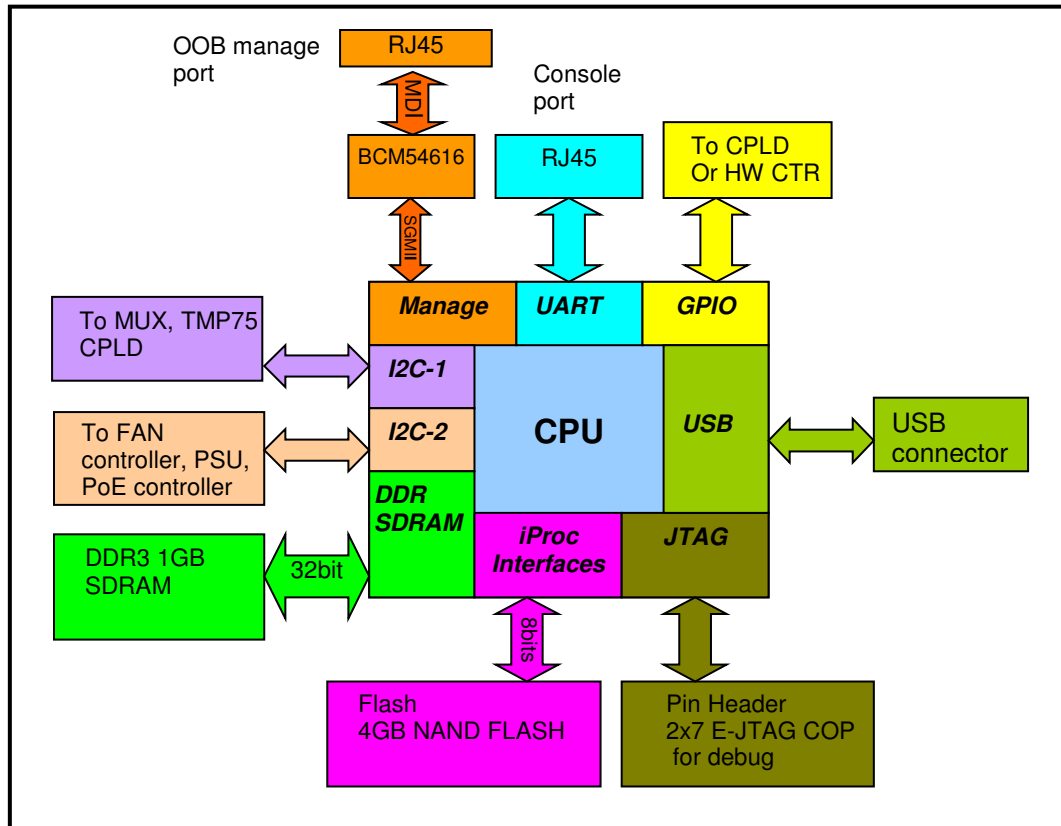


4.2. Physical Dimensions

440 x 387 x 44 mm (W x D x H)
17.32 x 15.24 x 1.73 inch



4.3.CPU Subsystem

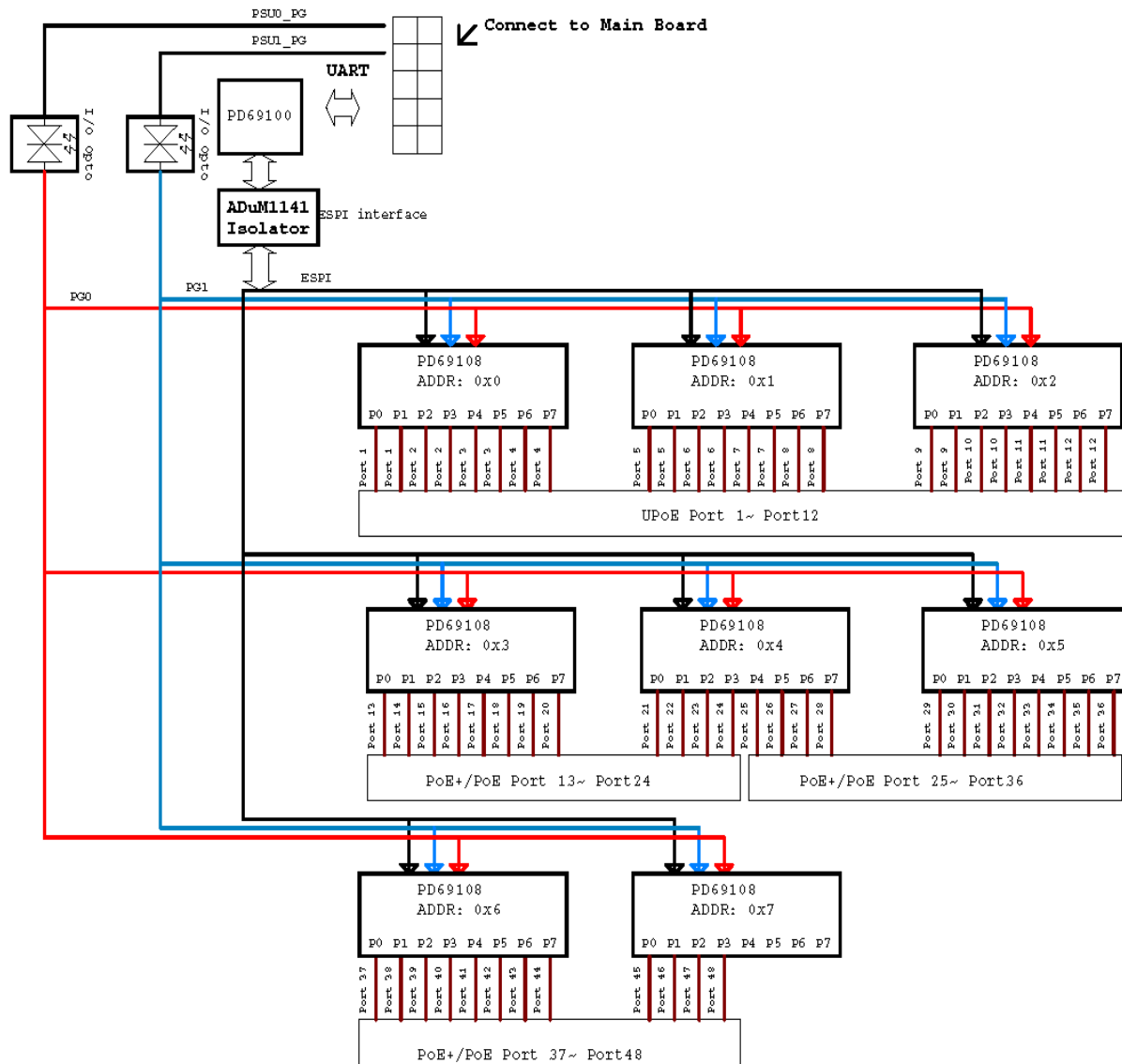


CPU- BCM56340 (ARM Cortex A9 processor)

The BCM56340 device integrates a dual core ARM Cortex A9 processor running at 1 GHz to allow a completed solution to be developed without an external host processor.

4.3.1.1. AG6248C-POE PoE+ Daughter Board

AG6248C-POE PoE+ Block Diagram



POE Power Management

The Agema product PoE manager uses software to handle the power budget for POE+ ports on/off control. The Agema product is using the Microsemi controller can support for the power budget control, port priority function and other PoE features.

1. **Power budget setting:** The power budget limitation as the tables illustrated here.

Model Name	System Power Maximum Dissipation	PoE Power budget limited			
		One PSU support		Two PSUs Optional	
		Maximum PSU output ability	POE+ power turn on limitation	Maximum PSUs output ability	POE+ power turn on limitation
AG6248C	140W	1100W	Power budget is 900W: The total POE supply power need to within the 900W.	2200W	Power budget is 1800W All PoE+/UPOE ports can be turned on.

Case	QTY	Watts for 54V Output	PoE Budget	PoE Capable Port	PoE Ports Power Allocation
1100W (PoE+)	1	900 W	900 W	48	30 x 30 W
1100W (UPoE)	1	900 W	900 W	48	12 x 60W + 6 x 30 W

2. **Port Priority setting:**
 - a. If the total power exceeds the power budget then low priority ports will turn off directly.
 - b. The Port Priority will be setting by user via software feature.
 - c. All of ports will have a low priority as default setting.

Note:

1. POE port power allocation is based on user requirement and able to add up to 900W per PSU.
2. Port 1 ~ Port 12 can be able to either UPoE with 60W or PoE+ with 30W per port.
3. Port 13 ~ Port 48 only be able to PoE+ with 30W per port.
4. AG6248C has an optional second PSU for future use if needed.

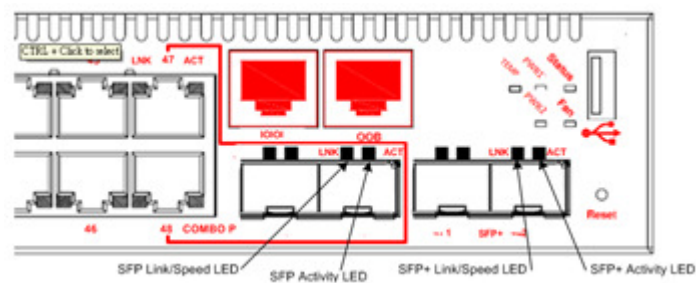
4.3.2.LED Definition for System

4.3.2.1. LED Definition for System

System LEDs indication including System, Master, Power, temperature and Fan Status

Feature	Detailed Description	Comment
STATUS LED (Bi-color LED)	Solid Green –Normal operation Blinking Green – Booting Solid Red –Critical system error Blinking Red –Non-critical system error (fan fail, power supply fail)	At front side
POWER 1 LED (Single color LED)	Off – Power failure or no power Solid Green – Power is good Blinking Green – locator function is enable	At front side
POWER 2 LED (Single color LED)	Off – Power failure or no power Solid Green – Power is good Blinking Green – locator function is enable	At front side
FAN LED (Bi-color LED)	Solid Green –fan powered and @expected rpm Solid Red –fan failed	At front side
TEMP LED (Bi-color LED)	Solid Green – System temperature is below threshold limit Solid Red –System temperature has exceeded threshold limit	At rear side

Note: The system temperature threshold is 75 centigrade when one of thermal sensors over temperature. And the TEMP LED will be lighted up to RED.



4.3.2.2. Port LED definition

1G copper port LEDs

Feature	Detailed Description	Comment
Link/SPD LED (Left bi-color LED)	Green – Link at 1000Mbps Yellow – Link at 10/100Mbps Solid – Link OFF – No Link	
PoE Switch POE/ACT LED (Right bi-color LED)	Green Blinking – Activity, PoE power OFF Yellow Blinking – Activity, PoE power ON Yellow Solid – No Activity, PoE power ON OFF –No Activity, PoE power OFF	

SFP Combo port LEDs

Feature	Detailed Description	Comment
Link/SPD LED (Left bi-color LED)	Off – No Link Solid green –Link on 1000Mbps speed Solid Amber –Link on 100Mbps speeds	
ACT LED (Right single color LED)	Off – No Activity Blinking green – Activity	

SFP+ port LEDs

Feature	Detailed Description	Comment
Link/SPD LED (Left bi-color LED)	Off – No Link Solid green –Link on 10G speed Solid Amber –Link on 1G speeds	
ACT LED (Right single color LED)	Off – No Activity Blinking green –Activity	

OOB Ethernet port LEDs

Feature	Detailed Description	Comment
Link/SPD LED (Left bi-color LED)	Off – No Link Solid green – Link on 1G speed Solid Amber – Link on 100M or 10M speeds	
ACT LED (Right single color LED)	Off – No Link Blinking green – Transmitting / Receiving	

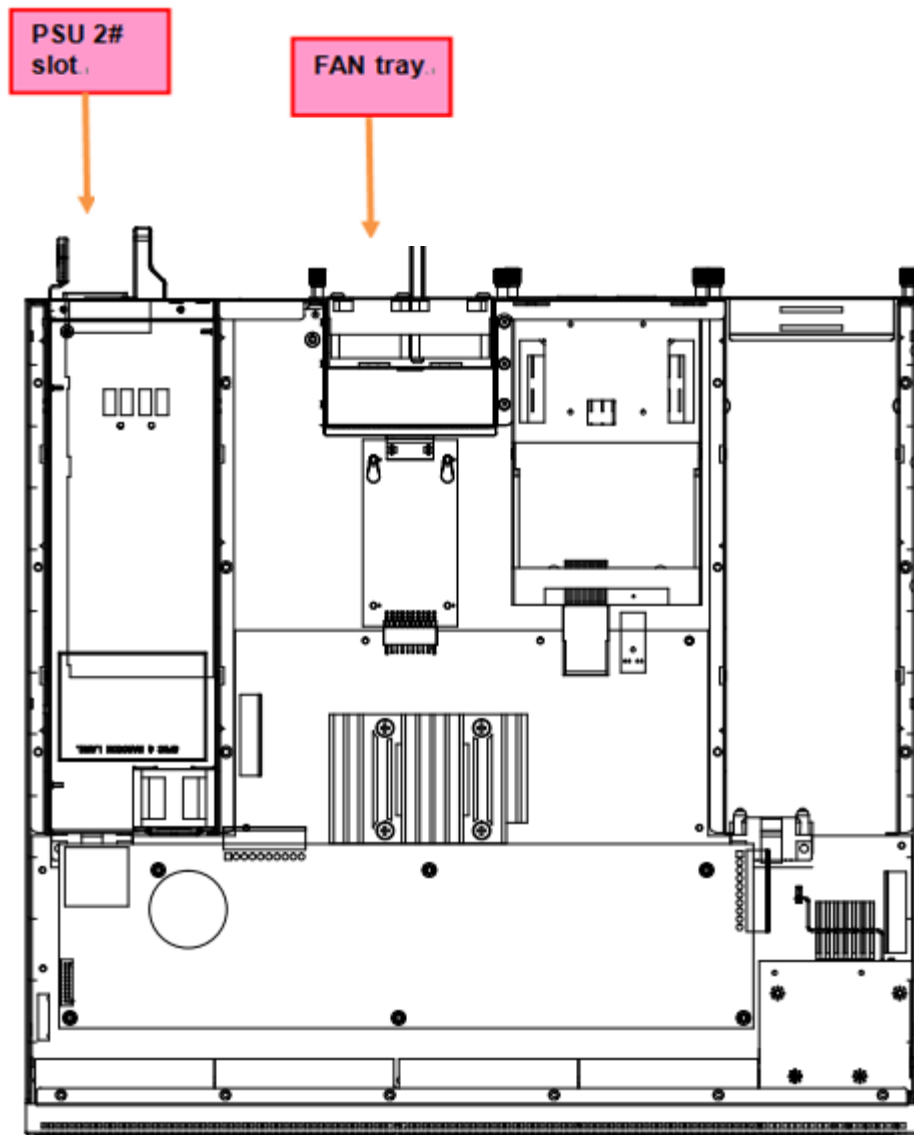
Console port LEDs

Feature	Detailed Description	Comment
Link/SPD LED (Left bi-color LED)	Off – No Link Solid green – Link is present	

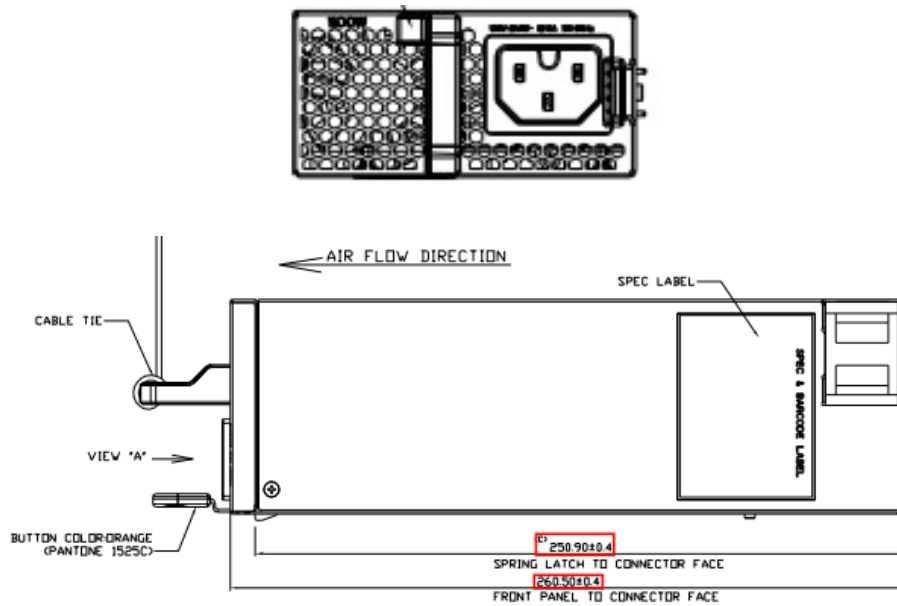
4.3.3. Power Supply & Fan Tray allocation

AG6248C-POE PoE system

- AG6248C-POE PSU: 1100W, DC output 54V/20.37A,
- 2 Fan units in one Fan tray (pluggable), Fan spec: 12000rpm 12VDC



4.3.3.1. AC Power Supply

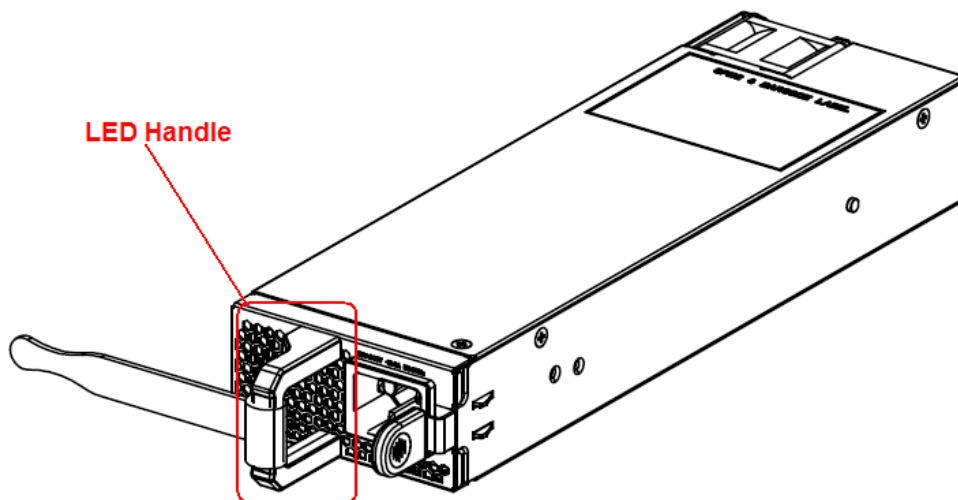


4.3.3.2. PSU LED Handle definition

The PSU has a LED handle to indicate the power supply status. The LED indication is controlled by PSU internal MCU. And the LED definitions please refer to below description.

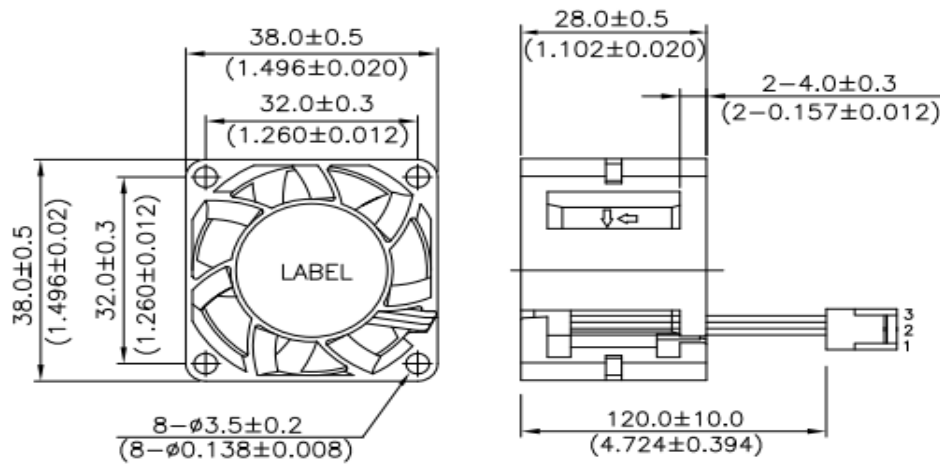
1100W PSU LED behaviors

- Off – No Power Supply
- Solid Green – Power is good
- Solid Red – detected, power bad



4.4. Fan specification

Description	Manufacturer	Part number
Air flow : Front to Back	Delta Electronics	FFB03812HN-DT26



NOTE:

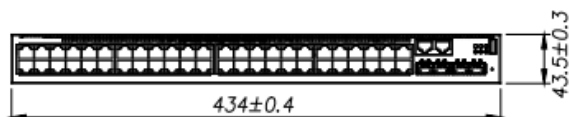
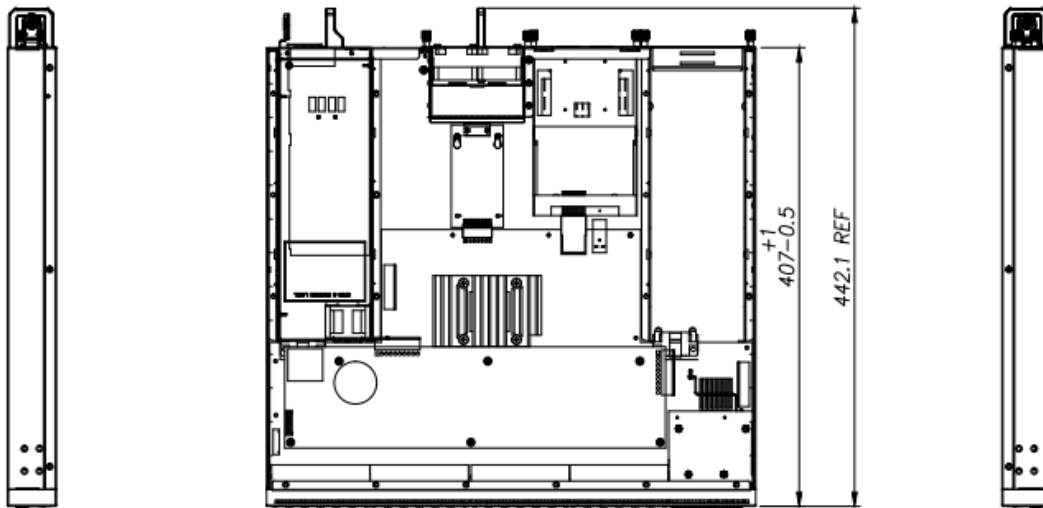
- 1.LEAD WIRE UL1061 AWG#24
PIN 1.RED WIRE----(+)
PIN 2.BLUE WIRE----(F00)
PIN 3.BLACK WIRE----(-)
- 2.HOUSING: MOLEX 5051-03 22-01-1032
- 3.TERMINAL: MOLEX 2759T 08-50-0113
- 4.THIS PRODUCT IS ROHS COMPLIANT.

UNIT: MM(INCH)

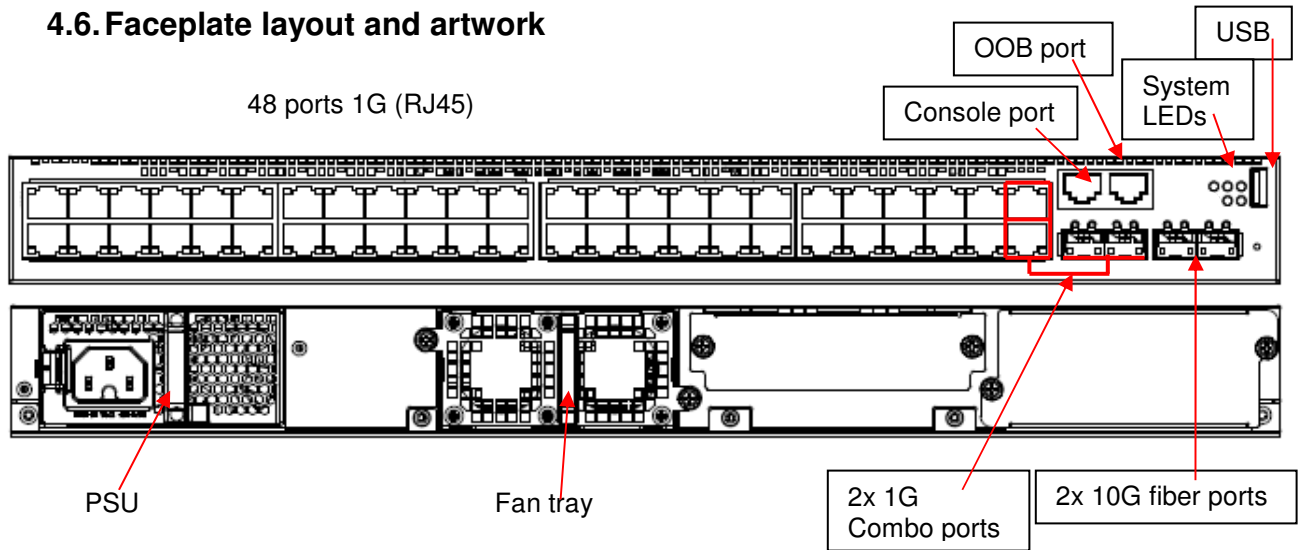
4.5. Mechanicals

**Main board PCB dimension*

428.4*241.5*2.1*



4.6. Faceplate layout and artwork



The front panel views for main key Components of AG6248C-POE

48x 1G Copper ports (RJ45)

2x 1G fiber ports

2x 10G fiber ports

1x OOB port (RJ45)

1x Console port (RJ45)

System LEDs (Status/Fan/PSU 1/PSU2/TEMP)

1x USB-Type-A



The rear panel views for main key components of AG6248C-POE

1x PSU (1100W, DC output 54V/20.37A),

1x Fan tray module



4.7. PCB Stack up

8-Layer↵

Structure (Stack up)			
Layer	Type		
	Solder mask		
1	TOP	L1 - SIGNAL (0.5oz)	
	prepreg		
2	G	L2 - GROUND(1oz)	
	core		
3	S	L3 - SIGNAL(1oz)	
	prepreg		
4	PWR	L4 - Power (1oz)	
	core		
5	PWR	L5 - Power (1oz)	
	prepreg		
6	S	L6 - SIGNAL(1oz)	
	core		
7	G	L7 - GROUND(1oz)	
	prepreg		
8	BOT	L8 - SIGNAL(0.5oz)	
	solder mask		
			board thickness=2.1mm

5. Software Support

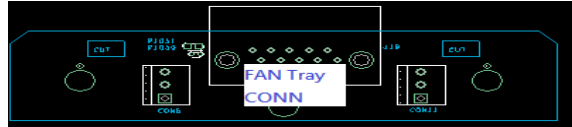
AG6248C-POE supports ONIE

6. Critical Components

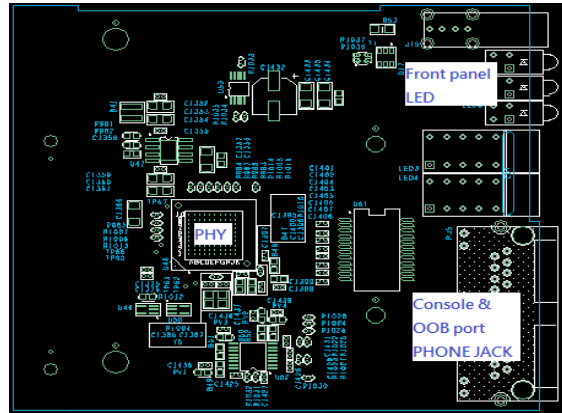
Description	Manufacturer	Part number
IC ETH SW 48P+4P 1GB+10GB	Broadcom	BCM56340A0KFSBG
IC ETH X'CEIVER 8P GB FBGA-400B	Broadcom	BCM54285C1KFBG
IC ETH X'CEIVER 8P GB FBGA-256B	Broadcom	BCM54282C1KFBG
IC ETH PHY 2P 10GB BGA-144B	Broadcom	BCM84752A1IFSBG
IC ETH X'CEIVER 10/100/GB-T FBGA-100B	Broadcom	BCM54616SC0KFBG
PHONE JACK LF LED 10P8C 6*2	Delta	RPGC-12AF0360DR
PHONE JACK LF LED 10P8C 6*2	Delta	RPGC-12AF8050DR
Dual core ARM Cortex-A9	Broadcom	BCM56340 Integrated CPU
DDR3 SDRAM	Samsung	K4B4G1646D0BCK0
NAND Flash	Micron	MT29F32G08ABAAAWP-Z:A
DC-DC Converter 36V 75V 12V 216W	Delta	Q48SK12018NRFH
Power Supply Unit (PSU)	Delta	DSP-1100CB-2 A
PoE	Microsemi	PD69100-026301 + PD69108ILQ
Fans	Delta	FFB03812HN-DT26
USB	Wieson	G3502-121141

PCB board outlook

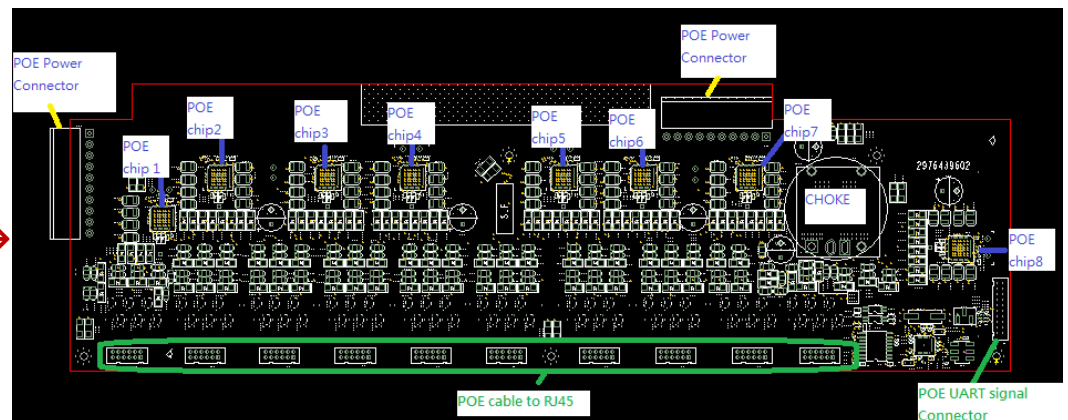
FAN board →



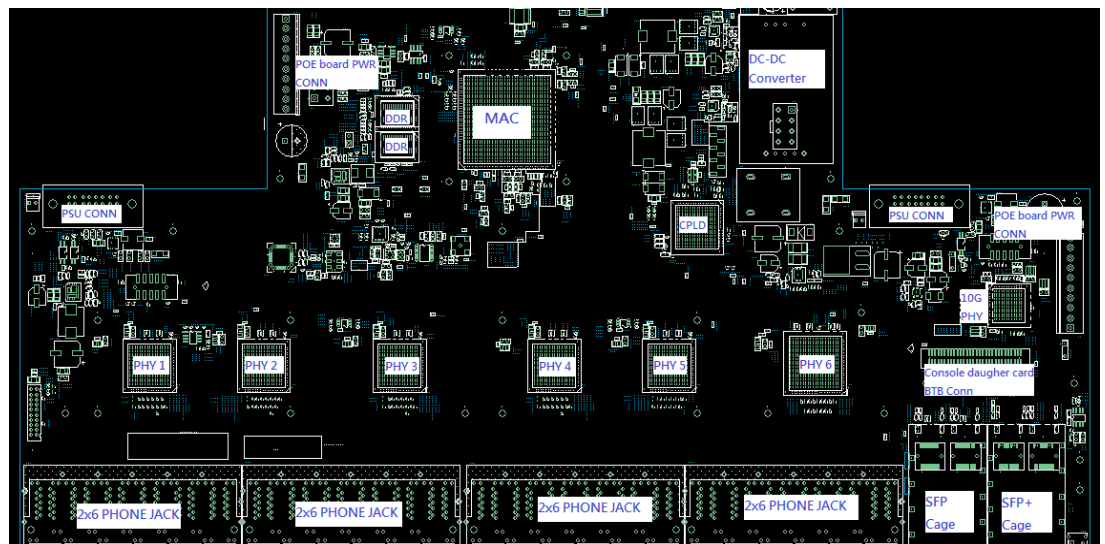
Console board →



POE Daughter board →



Main board
(Embedded
ARM-Cortex
A9 CPU) →



7. 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-8079
IEEE802.3x flow control

Interface

USB connector (USB to DB9)

Physical Dimensions

440 x 387 x 44 mm (W x D x H)
17.32 x 15.24 x 1.73 inch

Electromagnetic Emission

- FCC Class A, CE Class A, VCCI Class A

Safety Agency approval

- UL, CUL