cPCI-A3ETH

User's Manual

3U CompactPCI® Serial 5-Port Serial Ethernet, Optional POE Card



Manual Rev.: 0.2 Preliminary
Revision Date: November 19, 2024
Part Number: 50M-32013-1000

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Revision History

Revision	Description	Date	By
0.1	Preliminary release	2024-11-07	AL
0.2	Specifications, mechanical layout, and connector pinouts added	2024-11-19	AL

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Preface

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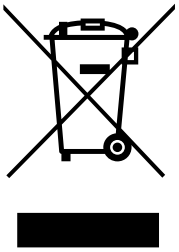
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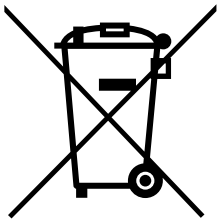
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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



NOTE:

Additional information, aids, and tips that help users perform tasks.



CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

The 3U 4HP CPCI-S.0 CompactPCI Serial peripheral, cPCI-A3ETH, is an Ethernet card with Power over Ethernet (PoE) functionality, featuring 5x RJ45 ports via PCIe. All 5 Ethernet ports support both front and rear transitions, offering flexible connectivity options. The cPCI-A3ETH is specifically designed for use in standard CPCI-S.0 systems, providing reliable and scalable network solutions for industrial and embedded applications.

1.1 Features

- Follow PICMG® CompactPCI® Serial design guide
- CompactPCI® Serial, 3U 4HP/8HP
- 5x RJ-45 ports support up to 2.5G via Intel® i22GIT Ethernet controllers
- Optional PoE supported
- Operating temperature: -40°C to +85°C
- Designed to meet EN50155 standards

1.2 Package Contents

The cPCI-A3ETH is packaged with the following components. If any of these items are missing or damaged, please retain the shipping carton and packing material and contact your dealer for inspection. Authorization must be obtained before returning any product to ADLINK. The contents of the cPCI-A3ETH packaging may vary for non-standard configurations, depending on customer specifications.

CompactPCI Module

The cPCI-A3ETH module



The contents of non-standard cPCI-A3ETH configurations may vary depending on the customer's requirements.



This product must be protected from static discharge and physical shock. Never remove any of the components except at a static-free workstation. Use the anti-static bag shipped with the product when putting the board on a surface. Wear an anti-static wrist strap properly grounded on one of the system's ESD ground jacks when installing or servicing system components.

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2 Specifications

2.1 Product Specification

PCIe Bus Architecture	• Follow PICMG® CompactPCI® Serial design guide • 1x PCIe Gen 3.0 x 4 from P1
Ethernet	• 5x RJ45 ports, 2.5G via Intel i226IT • With optional PoE function, by following PoE 802.3af standard (8HP SKU)
Form Factor	• 3U 4HP CPCI-S.0 standard • 3U 8HP CPCI-S.0 standard • with P1, P3 & P4 to rear
Power Board	• DB-A3PW board to board type to support 8HP on POE function with more power
OS Support	• Windows 10 • Ubuntu 22.X
Environmental & Certification	Environment: • Operating temperature: -40°C to 85° when provided with 1.5m/s airflow & conduction cooled (on wedge lock) • Storage temperature: -40°C to 95°C • Humidity: 5% to 95% relative humidity (non-condensing) • RoHS 2.0 & REACH EMC: • EN61000-6-4 / 6-2 • UKCA/CE • FCC Part 15B CLASS A
Dimensions	• 3U 1-slot 4HP 100 x 160 x 20.32 mm (L x W x H) 3U 2-slot 8HP 100 x 160 x 40.64 mm (L x W x H)
MTBF	• 15.1 Years at minimum
Weight	• TBC

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2.2 Block Diagram

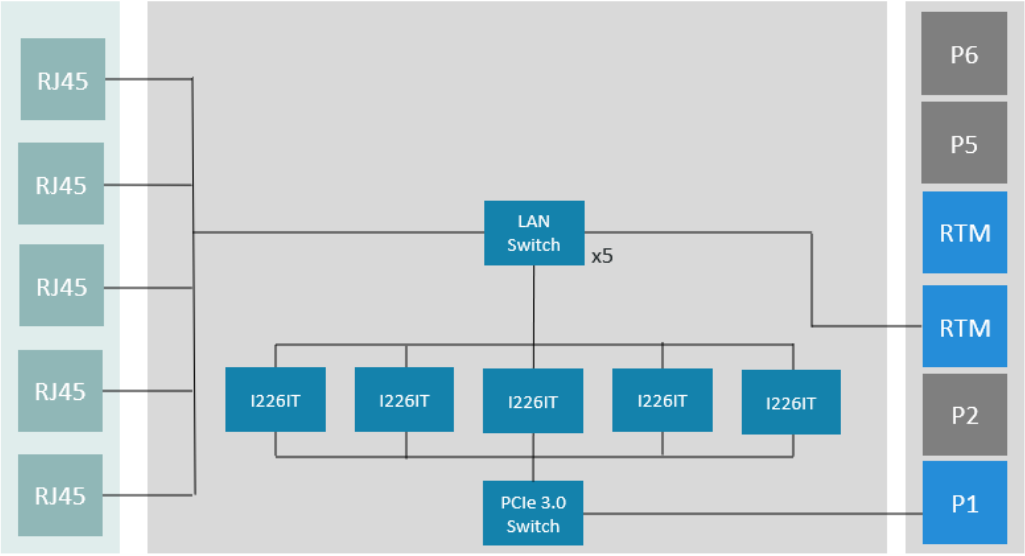
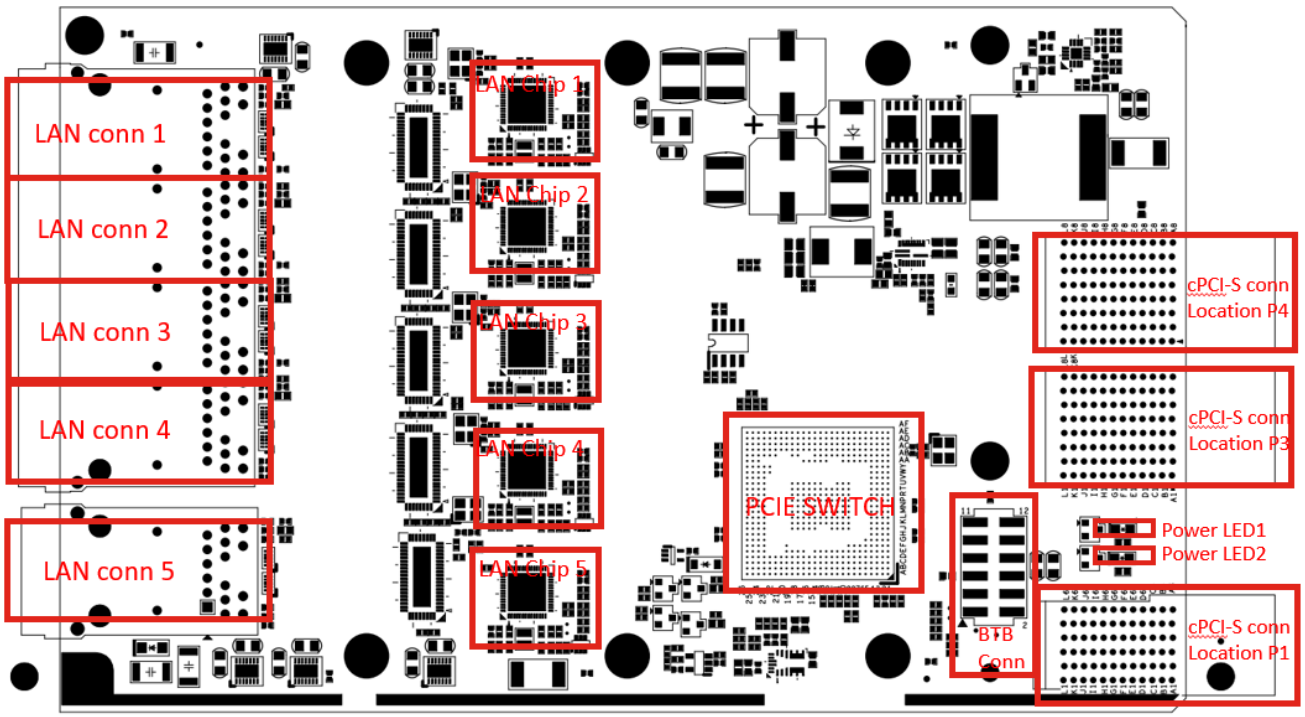


Figure 1: Functional block diagram

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3 Mechanical Layout

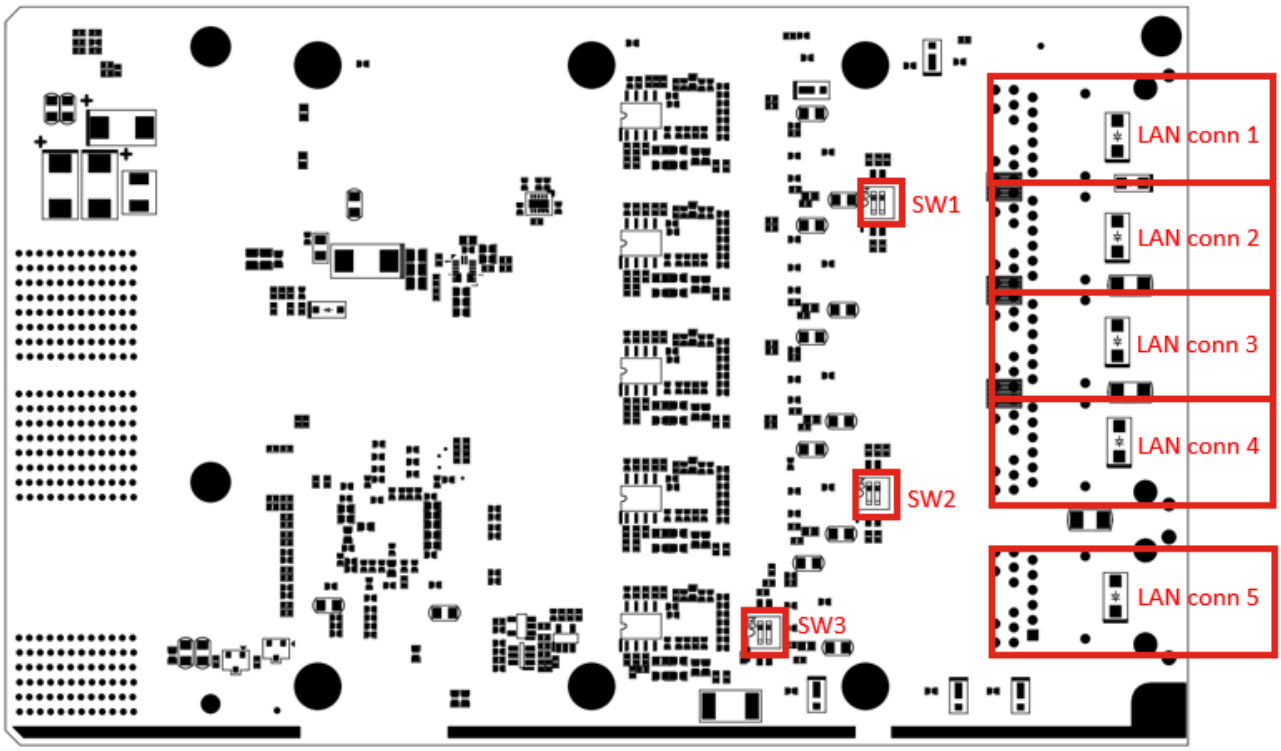
3.1 cPCI-A3ETH Connector and Switch Locations



P1, P3, P4	CompactPCI Serial connectors
Power OK LED 1 to 2	LED 1 (Green): for PCIe switch is ready LED 2 (Green): for POE is ready
BTB connector	Power board connector (DB-A3PW)
Switch	PCIe switch
LAN chip 1 to 5	Intel I226-IT LAN
LAN connector 1 to 5	RJ45 LAN connectors

Figure 2: IO connector and switch locations (Top)

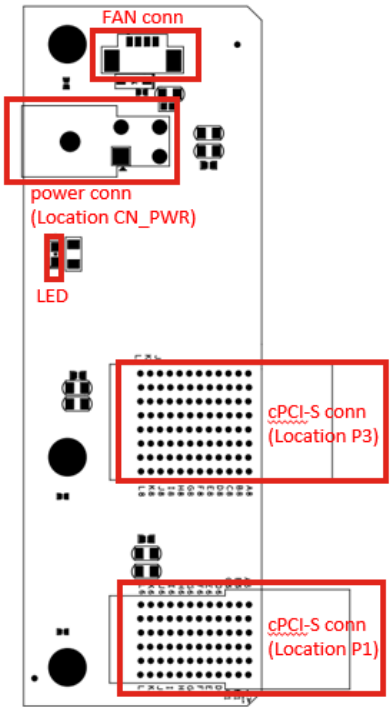
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SW1 and SW2	DisplayPort output switch

Figure 3: Connector and switch locations (Bottom)

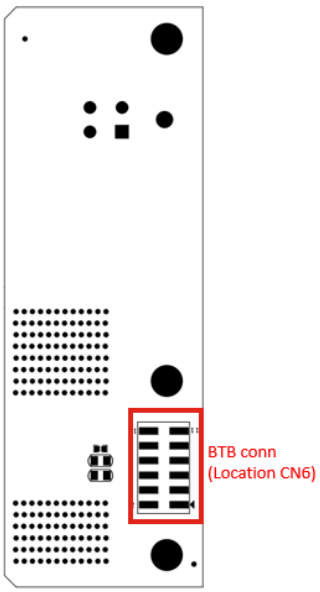
3.2 DB-A3PW Connector Locations and Functions



P1 and P3	CompactPCI Serial connectors
LED	12V power OK
Power connector	12V ATX 4 pin power connector
Fan connector	Fan connector

Figure 4: DB-A3PW power board connector locations (Top)

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BTB connector	Power board connector

Figure 5: DB-A3PW power board connector locations (Bottom)



Figure 6: DB-A3PW daughter board – SKU 1: Power input from P1)

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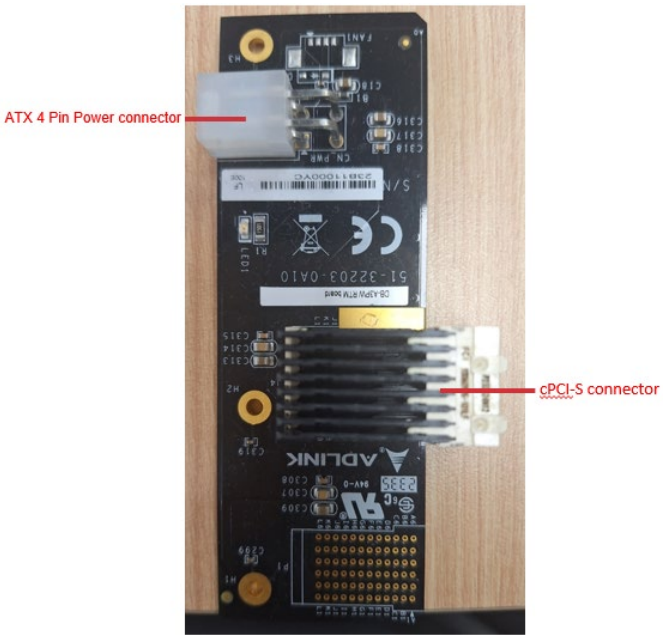


Figure 7: DB-A3PW rear board – SKU 2: Power input from ATX 4 pin connector

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4 Connector Pinouts

4.1 cPCI-A3ETH CompactPCI P1 Connector

Table 1: cPCI-A3ETH CompactPCI P1 connector

Pin	A	B	C	D	E	F
1	P12V_PSU	P_+5VSB	GND	P12V_PSU	P12V_PSU	GND
2	GND	P1_SMB_CLK	P1_SMB_DAT	GND	NC	NC
3	NC	NC	P1_GA0	NC	NC	P1_GA1
4	GND	NC	NC	GND	P1_PCIE_CLK0_P	P1_PCIE_CLK0_N
5	P1_PCIE_TX0_P	P1_PCIE_TX0_N	GND	P1_PCIE_RX0_P	P1_PCIE_RX0_N	GND
6	GND	P1_PCIE_TX2_P	P1_PCIE_TX2_N	GND	P1_PCIE_RX2_P	P1_PCIE_RX2_N

Pin	G	H	I	J	K	L
1	P12V_PSU	P12V_PSU	GND	P12V_PSU	P12V_PSU	GND
2	GND	P1_RST#	P1_WAKE_OUT#	GND	P1_PCIE_EN#	P1_SYSEN#
3	NC	NC	P1_GA2	NC	NC	P1_GA3
4	GND	NC	NC	GND	NC	NC
5	P1_PCIE_TX1_P	P1_PCIE_TX1_N	GND	P1_PCIE_RX1_P	P1_PCIE_RX1_N	GND
6	GND	P1_PCIE_TX3_P	P1_PCIE_TX3_N	GND	P1_PCIE_RX3_P	P1_PCIE_RX3_N

4.2 cPCI-A3ETH CompactPCI P3 Connector

Table 2: cPCI-A3ETH CompactPCI P3 connector

Pin	A	B	C	D	E	F
1	LAN5_RTM_MDI0_P	LAN5_RTM_MDI0_N	GND	LAN5_RTM_MDI1_P	LAN5_RTM_MDI1_N	GND
2	GND	LAN4_RTM_MDI0_P	LAN4_RTM_MDI0_N	GND	LAN4_RTM_MDI1_P	LAN4_RTM_MDI1_N
3	NC	NC	GND	NC	NC	GND
4	GND	LAN3_RTM_MDI0_P	LAN3_RTM_MDI0_N	GND	LAN3_RTM_MDI1_P	LAN3_RTM_MDI1_N
5	NC	NC	GND	NC	NC	GND
6	GND	LAN2_RTM_MDI0_P	LAN2_RTM_MDI0_N	GND	LAN2_RTM_MDI1_P	LAN2_RTM_MDI1_N
7	NC	NC	GND	NC	NC	GND
8	GND	LAN1_RTM_MDI0_P	LAN1_RTM_MDI0_N	GND	LAN1_RTM_MDI1_P	LAN1_RTM_MDI1_N

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Pin	G	H	I	J	K	L
1	LAN5_RTM_MDI2_P	LAN5_RTM_MDI2_N	GND	LAN5_RTM_MDI3_P	LAN5_RTM_MDI3_N	GND
2	GND	LAN4_RTM_MDI2_P	LAN4_RTM_MDI2_N	GND	LAN4_RTM_MDI3_P	LAN4_RTM_MDI3_N
3	NC	NC	GND	NC	NC	GND
4	GND	LAN3_RTM_MDI2_P	LAN3_RTM_MDI2_N	GND	LAN3_RTM_MDI3_P	LAN3_RTM_MDI3_N
5	NC	NC	GND	NC	NC	GND
6	GND	LAN2_RTM_MDI2_P	LAN2_RTM_MDI2_N	GND	LAN2_RTM_MDI3_P	LAN2_RTM_MDI3_N
7	NC	NC	GND	NC	NC	GND
8	GND	LAN1_RTM_MDI2_P	LAN1_RTM_MDI2_N	GND	LAN1_RTM_MDI3_P	LAN1_RTM_MDI3_N

4.3 cPCI-A3ETH CompactPCI P4 Connector

Table 3: cPCI-A3ETH CompactPCI P4 connector

Pin	A	B	C	D	E	F
1	NC	NC	GND	NC	NC	GND
2	GND	POE_PWRMGT_R	NC	GND	NC	NC
3	LAN3_RTM_LED2-L	NC	GND	LAN4_RTM_LED0-L	LAN4_RTM_LED1-L	GND
4	GND	P12V_PSU	P12V_PSU	GND	P12V_PSU	P12V_PSU
5	P12V_PSU	P12V_PSU	GND	P12V_PSU	P12V_PSU	GND
6	GND	LAN1_RTM_LED0-L	LAN1_RTM_LED1-L	GND	LAN1_RTM_LED2-L	LAN2_RTM_LED0-L
7	P_+3V3_S	P_+3V3_S	GND	P_+3V3_S	P_+3V3_S	GND
8	GND	NC	NC	GND	NC	NC

Pin	G	H	I	J	K	L
1	NC	NC	GND	NC	NC	GND
2	GND	NC	NC	GND	NC	NC
3	LAN4_RTM_LED2-L	LAN4_RTM_LED0-L	GND	LAN5_RTM_LED1-L	LAN5_RTM_LED2-L	GND
4	GND	P12V_PSU	P12V_PSU	GND	P12V_PSU	P12V_PSU
5	P12V_PSU	P12V_PSU	GND	P12V_PSU	P12V_PSU	GND
6	GND	LAN2_RTM_LED1-L	LAN2_RTM_LED2-L	GND	LAN3_RTM_LED0-L	LAN3_RTM_LED1-L
7	NC	NC	GND	NC	NC	GND
8	GND	NC	NC	GND	NC	NC

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4.4 DB-A3PW P1 Connector – SKU 1

Table 4: cPCI-A3ETH CompactPCI P3 connector

Pin	A	B	C	D	E	F
1	P_+12V	NC	GND	P_+12V	P_+12V	GND
2	GND	NC	NC	GND	NC	NC
3	NC	NC	NC	NC	NC	NC
4	GND	NC	NC	GND	NC	NC
5	NC	NC	GND	NC	NC	GND
6	GND	NC	NC	GND	NC	NC

Pin	G	H	I	J	K	L
1	P_+12V	P_+12V	GND	P_+12V	P_+12V	GND
2	GND	NC	NC	GND	NC	NC
3	NC	NC	NC	NC	NC	NC
4	GND	NC	NC	GND	NC	NC
5	NC	NC	GND	NC	NC	GND
6	GND	NC	NC	GND	NC	NC

4.5 DB-A3PW RJ4 Connector – SKU 2

Table 5: DB-A3PW RJ4 connector – SKU 2

Pin	A	B	C	D	E	F
1	NC	NC	GND	NC	NC	GND
2	GND	GND	NC	GND	NC	NC
3	NC	NC	GND	NC	NC	GND
4	GND	P_+12V	P_+12V	GND	P_+12V	P_+12V
5	P_+12V	P_+12V	GND	P_+12V	P_+12V	GND
6	GND	NC	NC	GND	NC	NC
7	NC	NC	GND	NC	NC	GND
8	GND	NC	NC	GND	NC	NC

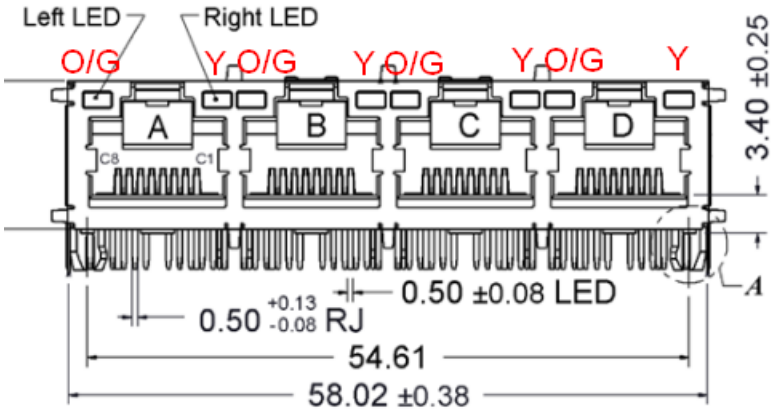
Pin	G	H	I	J	K	L
1	NC	NC	GND	NC	NC	GND
2	GND	NC	NC	GND	NC	NC
3	NC	NC	GND	NC	NC	GND
4	GND	P_+12V	P_+12V	GND	P_+12V	P_+12V
5	P_+12V	P_+12V	GND	P_+12V	P_+12V	GND
6	GND	NC	NC	GND	NC	NC
7	NC	NC	GND	NC	NC	GND
8	GND	NC	NC	GND	NC	NC

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4.6 LAN Connectors

4.6.1 4-Port LAN (RJ1)

Table 6: LAN connector



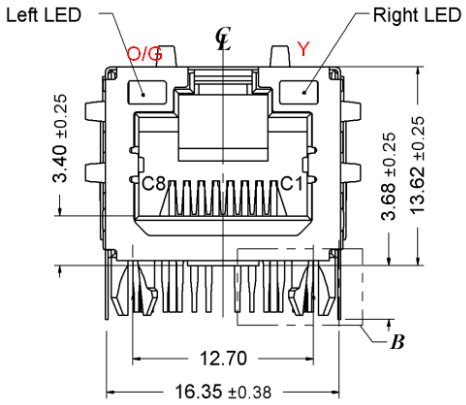
Pin	Signal
R11	MDI0_P
R10	MDI0_N
R4	MDI1_P
R5	MDI2_P
R3	MDI2_N
R2	MDI1_N
R8	MDI3_P
R9	MDI3_N
R13	POE power
R14	POE power

LED	Status	Color
Right	Link / Active	Blinking
Left	Speed 10/100	Off
Left	Speed 1000	Green
Left	Speed 2500	Orange

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4.6.2 1-Port LAN (RJ3)

Table 7: LAN connector



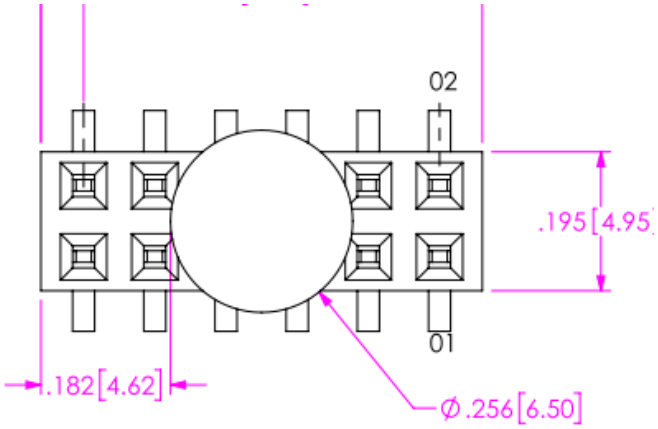
Pin	Signal
R11	MDI0_P
R10	MDI0_N
R4	MDI1_P
R5	MDI2_P
R3	MDI2_N
R2	MDI1_N
R8	MDI3_P
R9	MDI3_N
R13	POE power
R14	POE power

LED	Status	Color
Right	Link / Active	Blinking
Left	Speed 10/100	Off
Left	Speed 1000	Green
Left	Speed 2500	Orange

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4.7 cPCI-A3ETH Board to Board Connector (CN6)

Table 8: Board to board connector

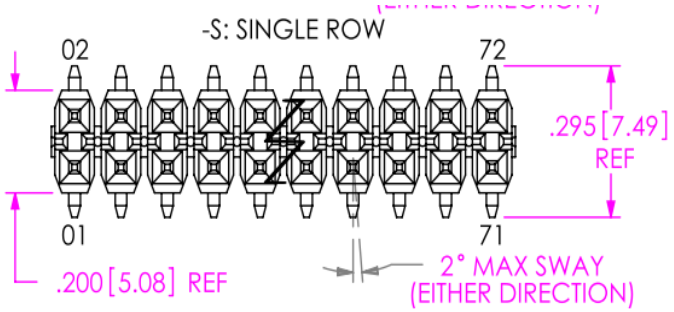


Pin	Signal	Function
1	P12V_PSU	Provide additional power from another peripheral card (Power Board-DB-A3PW) to enable full PoE wattage.
2	P12V_PSU	
3	P12V_PSU	
4	P12V_PSU	
5	P12V_PSU	
6	P12V_PSU	
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	POE_PWRMGT_R	Control PoE power wattage. When connecting another peripheral card (Power Board), this pin should be low to enable full PoE wattage.
12	GND	Ground

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4.8 DB-A3PW Board to Board Connector (CN6) – SKU 1

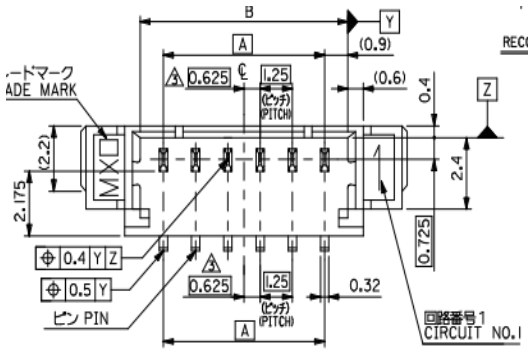
Table 9: DB-A3PW board to board connector



Pin	Signal	Function
1	P12V_PSU	12V power from P1 via CN6 to 1F front board
2	P12V_PSU	
3	P12V_PSU	
4	P12V_PSU	
5	P12V_PSU	
6	P12V_PSU	
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	GND	Ground

4.9 DB-A3PW FAN Connector (FAN) – SKU 1

Table 10: DB-A3PW FAN connector

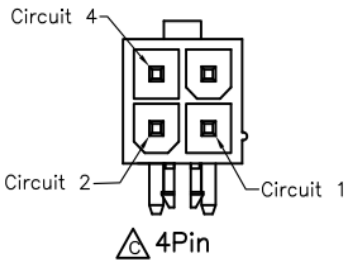


Pin	Signal Name
1	NC
2	NC
3	FAN_PWR
4	GND

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4.10 DB-A3PW ATX 4 Pin Power Connector (CN_PWR) – SKU 2

Table 11: DB-A3PW ATX 4 pin power connector



Pin	Signal Name	Function
1	GND	Ground
2	GND	Ground
3	P_+12V	12V Power Source
4	P_+12V	12V Power Source

4.11 Switch Connector

The cPCI-A3ETH has three DIP switches (SW1-3) to set the switch connectors.

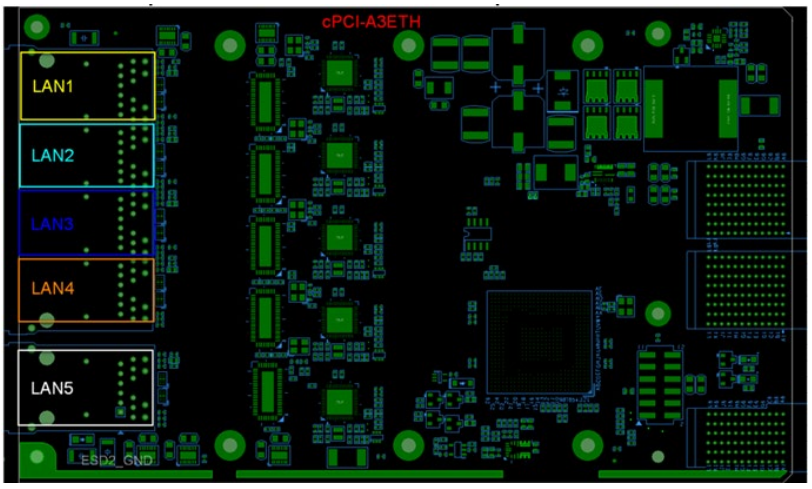
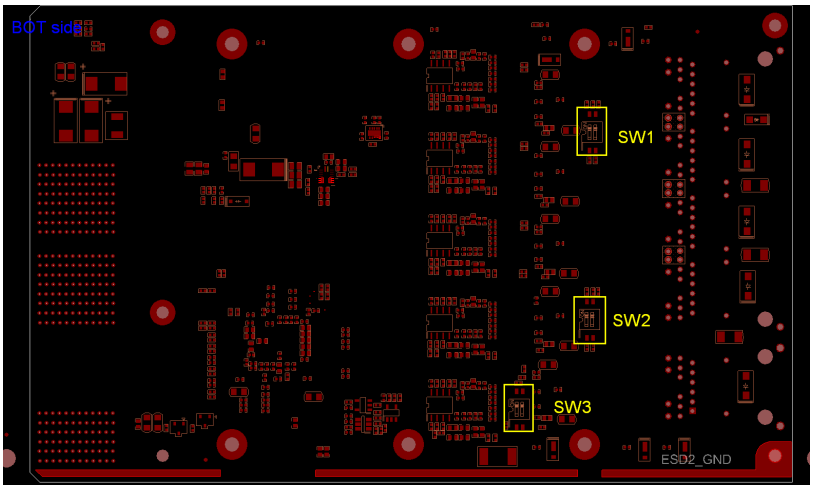


Figure 8: Switch and output LAN location (Top)



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Figure 9: Switch locations (Bottom)

Table 12:Switch connector 1, 2, and 3

SW1 Mode Switch Settings

SW1	LAN Port	Pin 1	Pin 2
cPCI-A3ETH	LAN 1 output	Off	
Display Port 4 Output (CN3)	LAN 2 output		Off

SW2 Mode Switch Settings

SW2	LAN Port	Pin 1	Pin 2
cPCI-A3ETH	LAN 3 output	Off	
Display Port 2 Output (CN2)	LAN 4 output		Off

SW3 Mode Switch Settings

SW3	LAN Port	Pin 1	Pin 2
cPCI-A3ETH	LAN 5 output	Off	

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Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User‘s Manual for later reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment, turn off the power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources.
  - Keep equipment away from high heat or high humidity.
  - Keep equipment properly ventilated (do not block or cover ventilation openings).
  - Make sure to use recommended voltage and power source settings.
  - Always install and operate equipment near an easily accessible electrical socket-outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings.
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

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