AEC-8x00 Series

NVIDIA® Jetson Thor T5000

AI Embedded Computer

User's Manual

Version 1.0

Date:

P/N:

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Revision History

Version	Release Time	Description
1.0	2026.07	Initial release

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Contents

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I. Preface

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

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Declaration of Conformity

CE

The CE symbol on the computer indicates that it is in compliance with the directives of the Union European (EU). A certificate of compliance is available by contacting technical support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above-mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and plybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material.

Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.) Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu (0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH – Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1% by weight (1000 ppm)

Important Safety Instructions

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage.
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. DO NOT COVER THE OPENINGS.
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

10. If one of the following situations arises, get the equipment checked by service personnel.

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment does not work well, or you cannot get it to work according to the user's manual.

    e. The equipment has been dropped or damaged.

    f. The equipment has obvious signs of breakage.

11. Keep this User's Manual for later reference.

Warning

The Box PC and its components contain very delicately Integrated Circuits (IC). To protect the Box PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Box PC from the power source when you want to work on the inside.

2. Use a grounded wrist strap when handling computer components.

3. Place components on a grounded antistatic pad or on the bag that came with the Box PC, whenever components are separated from the system.

Replacing Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash can. It must be disposed of in accordance with local regulations concerning special waste.

Technical Support

If you have any technical difficulties, please consult the user's manual first at:

https://arbor-technology.com

Please do not hesitate to e-mail our customer service when you still cannot find out the answer:

E-mail: info@arbor.com.tw

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vender assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

II. Introduction

2.1. Specifications

System	
CPU	14-Core ARM® Neoverse™ V3AE 64-bit CPU
Memory	128GB LPDDR5X DRAM
GPU	2650-core NVIDIA Blackwell™ GPU with 5th Gen 96 Tensor Cores
Storage	1 x NVMe M.2 Key M 2280 x2 PCIe Gen5 (8xPoE, 8xUSB board, either one) 1 x NVMe M.2 Key M 2280 x4 PCIe Gen5
TPM	SLB9672XU2.0
I/O	
Serial Port	2 x RS-232/422/485 ports with DB9 connector
LAN	2 x GbE ports w/ RJ-45 connector, one port is NCSI OOB on board (Optional) 1 x QSFP for 4 x 25GbE
USB Port	4 x USB 3.2 Type A 1 x USB 3.2 Type C 1 x USB 3.2 Type C for BSP install (OTG)
Expansion Bus	2x10-pin Euro Terminal (1 x CAN-FD (Isolated 3KV), 3 x CAN-FD with Transceiver, +5V output 1A, +3.3V output 1A, UART, I2C) 1 x M.2 Key B (3042 for 4G LTE module or 3052 for 5G module) 1 x M.2 Key E (for WiFi 6E) 2 x M.2 Key M (for SSD) 2 x SIM sockets
Digital I/O Port	8-DI/ 8-DO with DB9 connector
Video Port	1 x USB Type C DP ALT mode 2 x HDMI output
GMSL	8 x Fakra-Z connectors for GMSL automotive cameras (AEC-8100/ AEC-8400)
PoE	8 x GbE PoE+ LAN with RJ-45 connector (AEC-8200/ AEC-8400) • 2 x IEEE802.3AT • 6 X IEEE802.3AF • Max. 90W

Environmental	
Operating Temp.	-25oC to 50oC, with 0.63 m/s air flow (77W TDP Fan mode)
Storage Temp.	-40oC to 85oC
Operating Humidity	5 ~ 95% (non-condensing)
Vibration	Operating, MIL-STD-810H, Method 516.8, Procedure I (TBA)
Shock	Operating, MIL-STD-810G, Method 514.6, Procedure I, Category 4 (TBA)
Qualification	
Certification	CE, FCC
Power Requirement	DC 9V – 36V with 3-pin terminal block, AT/ATX mode selectable
Ignition Switch	ACC IN/ IGN control (ACC optional, via switch)
Power Consumption	TBD
Mechanical	
Button	1 x Power Button, 1 x Force Recovery Button
Antenna	4 x Antenna holes for WiFi
Mounting	Wall mount
LED indicator	1 x System power 1 x Input power
Weight	4kg
Dimensions(W x D x H)	211 x 194 x 111mm
OS Support	
System	Ubuntu/ NVIDIA Jetpack 7.0
Ordering Information	
AEC-8000	Jetson Thor T5000 128GB LPDDR5X BOX PC
AEC-8100	Jetson Thor T5000 128GB LPDDR5X BOX PC, with 8 x GMSL
AEC-8200	Jetson Thor T5000 128GB LPDDR5X BOX PC, with 8 x PoE
AEC-8400	Jetson Thor T5000 128GB LPDDR5X BOX PC, with 8 x GMSL, 8 x PoE

2.2. System Overview

Features

- Small form factor NVIDIA® Jetson Thor T5000 supports up to 2070 TFLOPS AI performance.
- Advanced NVIDIA® Ampere™ architecture with NVIDIA® CUDA® core and 96 Tensor cores.
- Supports multiple 4G/ LTE/ WiFi/ BT/ GPRS/ UMTS connections.
- Supports 16-bit GPIO
- DC 9V -36V wide range power input.

About this manual

This manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about the description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

2.3. Overview

The Arbor AEC-8x00 series is an Arm-base Edge AI Computing System.

Powered by the NVIDIA® Jetson Thor T5000 platform, featuring a 2650-core NVIDIA® Ampere™ architecture GPU with 96 Tensor cores and 14-core Arm® Neoverse™ V3AE 64-bit CPU, the AEC-8x00 series delivers best-in-class capabilities, such as up to 2070 TFLOPS AI performance, power efficiency, any rugged configuration.

This makes it ideally suited for advanced Edge AI applications, including medical Imaging, High-speed AOI, Mobile Robots and any AIoT / Industry 4.0 applications. The AEC-8x00 series is equipped with I/O interfaces, including GbE LAN ports, USB 3.2 ports, UART ports and GPIO, CAN, PoE, GMSL ports. Furthermore, it offers seamless wireless connectivity options with M.2 Key E slot and storage capabilities throught the M.2 Key M PCIex4 NVMe SSD slots. With support for operating temperature from -25°C to 50°C, 9V to 36V wide range DC-in, the Arbor AEC-8x00 series brings small size and easy deployment of AI vision and industrial applications.

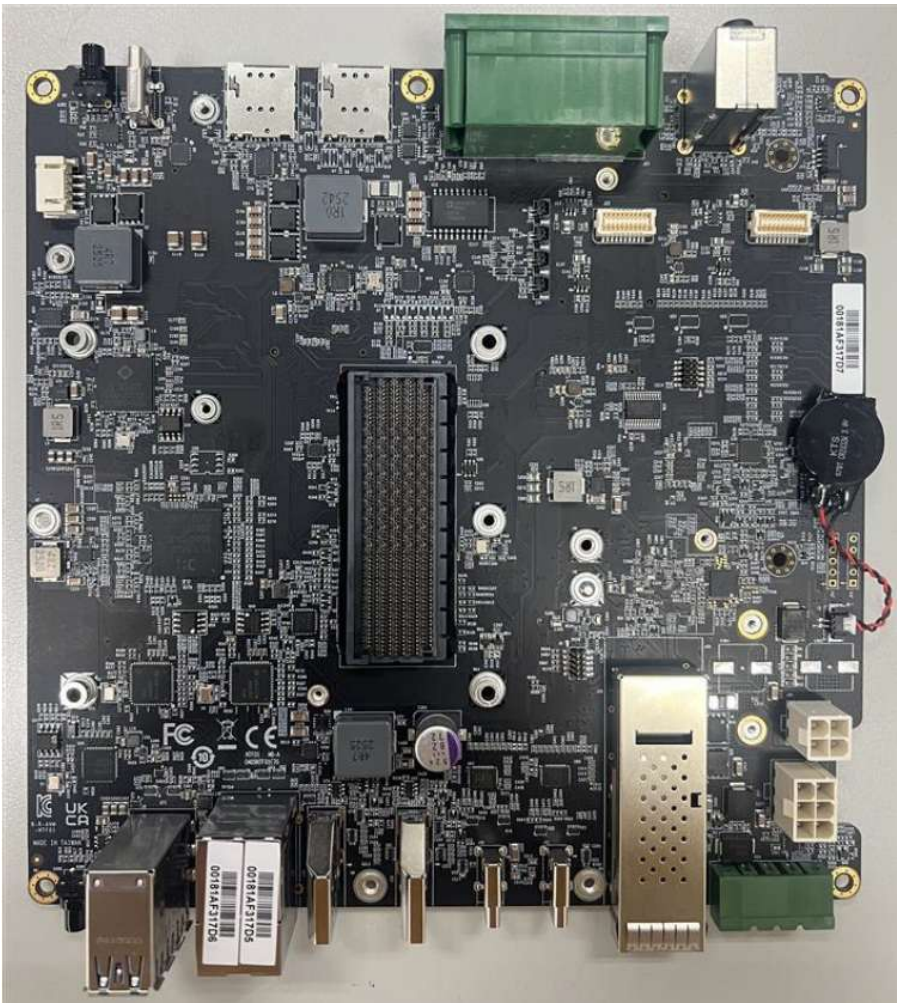
2.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:

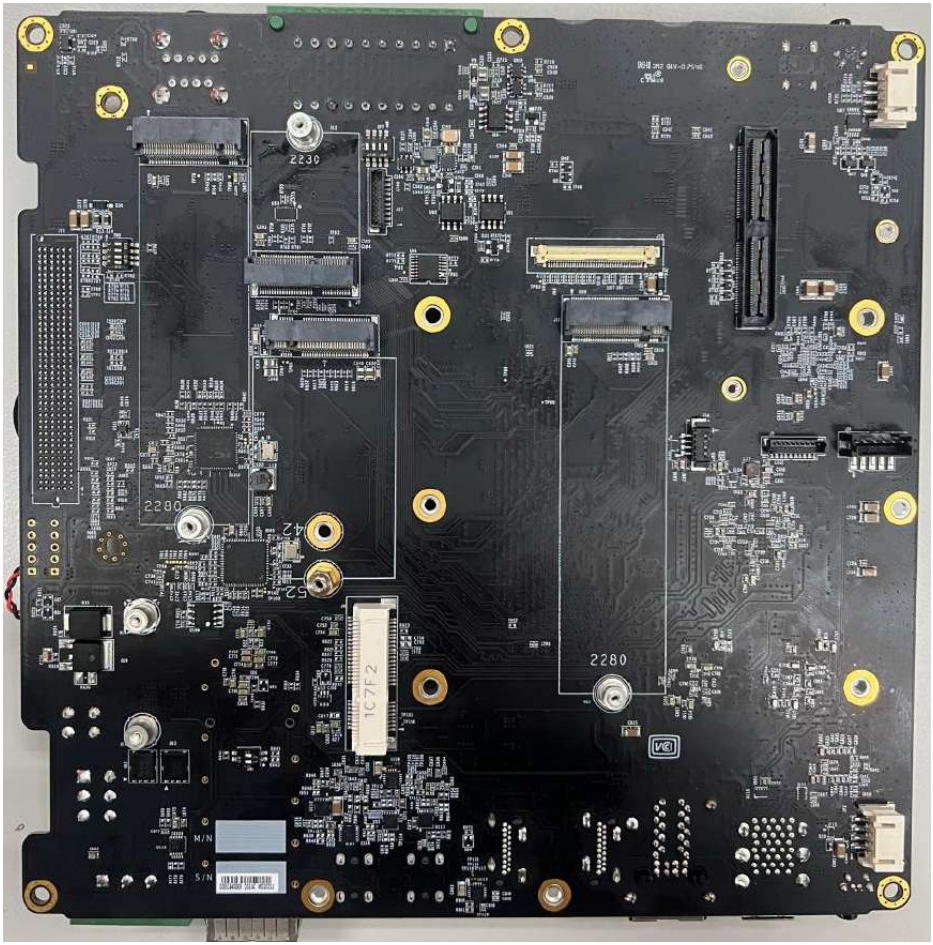
- 1 X AEC-8x00
- 1 x 240W power adapter
- US Power cord
- EU power cord

III. Board connector & Jumper Locations

3.1. Top View of carrier board



3.2. Bottom View of carrier board

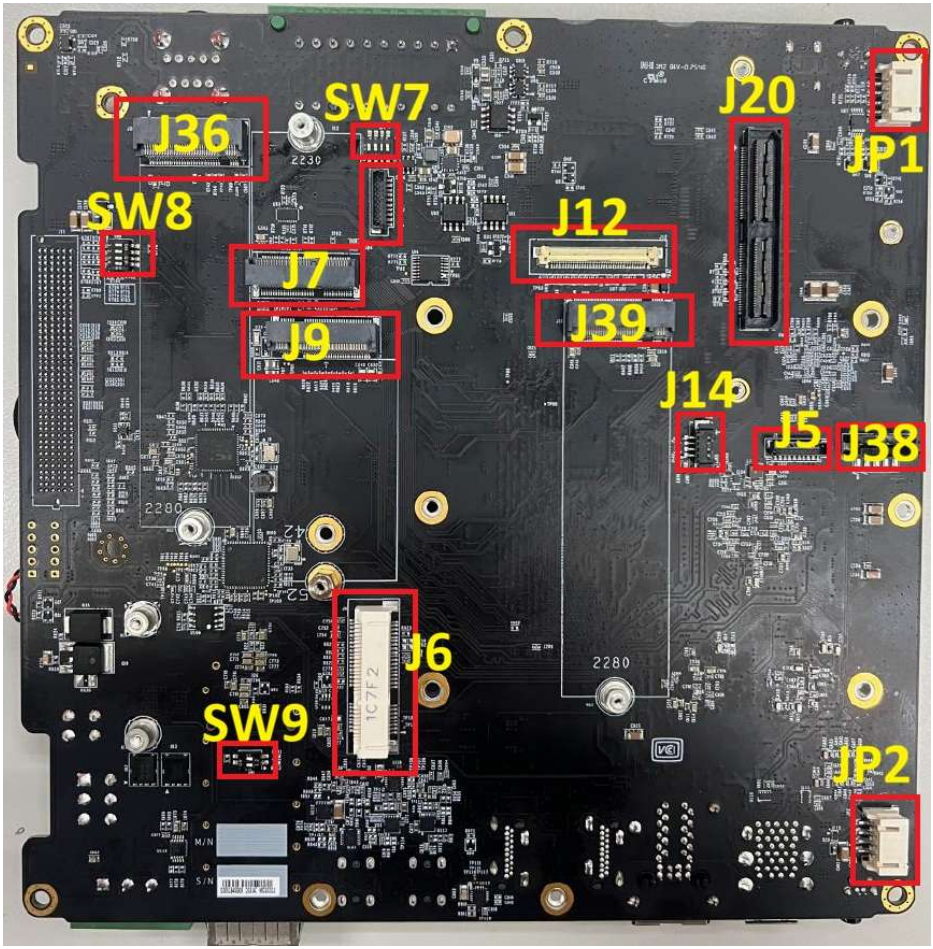


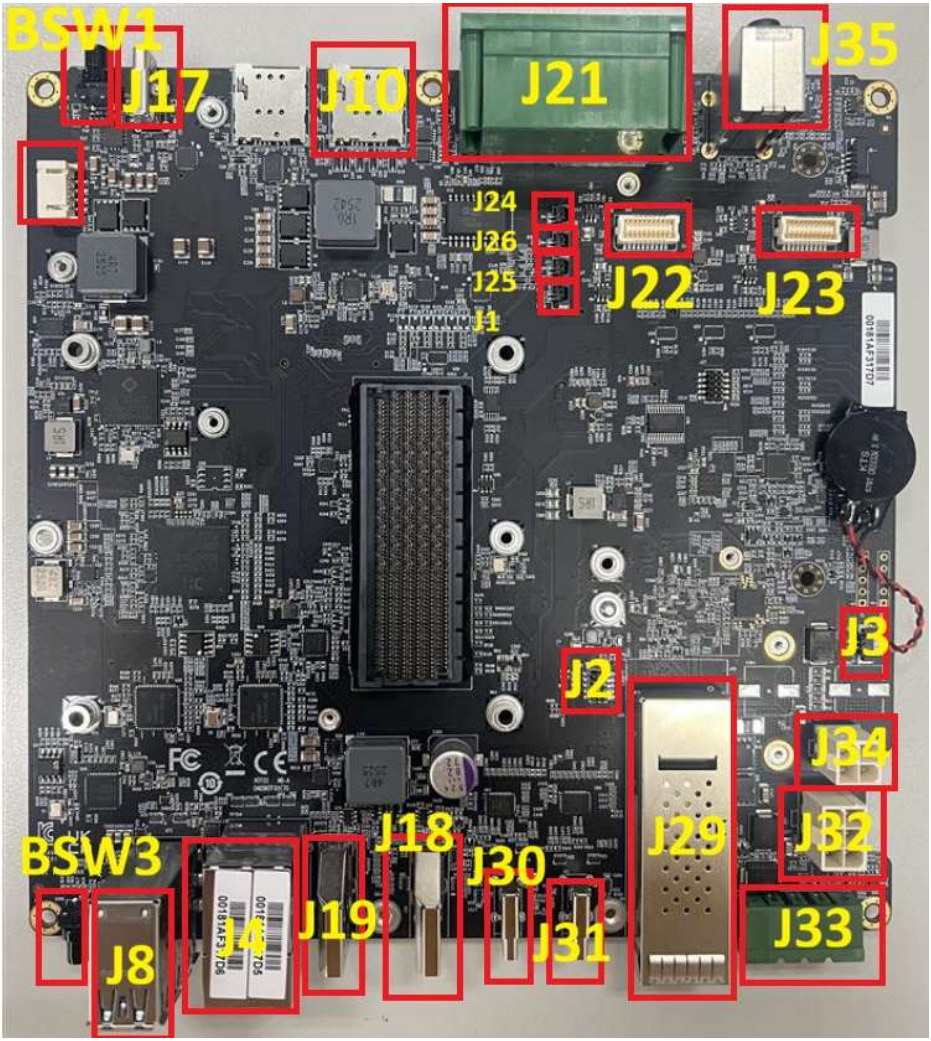
3.3. Connector Summary

J1	699-pin high-speed / high-density connector
J16	Fan wafer
J3	External RTC battery wafer
J18/ J19	HDMI output Type-A Vertical Side Connector (Female)
J31	USB 3.2 Gen2 Type C connector (Supports NVdia Jetson Flashing)
J30	USB Type C Power Supply Connector
J17	USB 2.0 Type C Connector (Debug UART)
J4	Gigabit Ethernet Connector w/ LEDs
J10	Micro SIM card socket (Push-Push)
J21	2x10 Euro Terminal block 1x CAN-FD
J22	20-pin Expansion header-1
J23	20-pin Expansion header-2
J29	QSFP
J32	Input Power – 4.2mm pitch ATX Power 6P
J33	Input Power – Terminal block 3-pin
J34	Output Power – 4.2mm pitch ATX power 4P
J35	3.5mm audio Jack
J2	5-pin JTAG Header
J24	OOB board connector (Power)
J25	OOB board connector (Reset)
J26	OOB board connector (Recover0
BSW1	Recovery Button w/ LEDs
BSW3	Power Button w/ LEDs
J36	M.2 M-key socket

J8	USB 3.2 Gen2 Type A connector
J7	M.2 E-key socket
J9	M.2 B-key socket
J6	Mini card socket
J27	OOB connector
J5	OOB NCSI connector
J14	4-pin USB wafer
J38	5-pin 12V DC output wafer
J39	M.2 M-key socket
J20	120-pin high speed board to board connector (to Carrier board)
J12	40-pin coaxial connector
JP1	Fan wafer
JP2	Fan wafer
SW7	Switch button
SW8	Switch button
SW9	Switch button

3.4. Carrier board Interface




BSW1
J17
J10
J21
J35
J24
J26
J25
J1
J22
J23
J3
J2
J34
J32
J29
J18
J30
BSW3
J19
J31
J33
J8

3.5. Feature Description

3.5.1. Jetson module connector

Function	Provide connection with NVIDIA® Jetson AGX Thor™ module
Location	J1
Description	Molex 699-pin socket
Manufacturer Part number	MOLEX, 203456-0003
Mating Connector	MOLEX, 203456-0003
Pinout	Please refer to NVIDIA Jetson™ AGX Thor™ System-on-Module datasheet for pinout details.
Remarks	https://developer.nvidia.com/embedded/downloads

3.5.2. Fan connector

<table>
<tr><td>Function</td><td>Fan connector</td></tr>
<tr><td>Location</td><td>J16/ JP1/ JP2</td></tr>
<tr><td>Description</td><td>Wafer 1x4 pin 2mm 90° SMD</td></tr>
<tr><td>Manufacturer
Part number</td><td>JOINT TECH
A2001WR-S-04PNLNT1T00R</td></tr>
<tr><td>Mating
Connector</td><td>JOINT TECH A2001WR-S-04PNLNT1T00R</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>GND</td></tr>
<tr><td>2</td><td>+12V</td></tr>
<tr><td>3</td><td>Fan_Tach</td></tr>
<tr><td>4</td><td>Fan_pwm</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.3. RTC Battery connector

Function	RTC battery for module
Location	J3
Description	WAFER_1*2PIN_1.25mm_90°
Manufacturer Part number	ACES 50271-00201-001
Mating Connector	Molex 51021-8602
Pinout	<table><tr><th>Pin #</th><th>Description</th></tr><tr><td>1</td><td>GND</td></tr><tr><td>2</td><td>RTC_BAT</td></tr></table>
Remarks	RTC Battery: KTS, CR2032_3V

3.5.4. HDMI OUTPUT

Function	HDMI output connector
Location	J19/ J18
Description	HDMI Type-A female connector
Manufacturer Part number	EDL TECHNOLOGY CO. HM-FVD480B
Mating Connector	Any HDMI standard Type-A interface cable or device.
Pinout	Please refer to HDMI standard .
Remarks	None

3.5.5. USB type C connector

Supports NVIDIA Jetson flashing

Function	BSP Installation as recovery mode
Location	J31
Description	USB3.2 TYPE-C Female connector
Manufacturer Part number	GM9-HF_JACK_SBC-240P-31HF-S277_-55+85℃
Mating Connector	Any Standard Type-C interface cable or device.
Pinout	Please refer to USB 3.2 Gen 2 standard
Remarks	J31 supports NVIDIA Jetson Flashing

3.5.6. USB type C Power Supply connector

Function	USB Type-C power supply
Location	J30
Description	USB3.1 TYPE-C Female connector
Manufacturer Part number	GM9-HF_JACK_SBC-240P-31HF-S277_-55+85℃
Mating Connector	Any Standard Type-C interface cable or device.
Pinout	Please refer to USB 3.1 type-C standard
Remarks	None

3.5.7. USB type C connector

Function	For dumping debug UART
Location	J17
Description	USB2.0 TYPE-C Female connector
Manufacturer Part number	GM9-HF_JACK_SBC-240P-31HF-S277_-55+85℃
Mating Connector	Any Standard Type-C interface cable or device.
Pinout	Please refer to USB 2.0 type-C standard
Remarks	None

3.5.8. M.2 M key 2230

Function	M.2 E key
Location	J7
Description	SOCKET_M.2-KEY E_75PIN_90°_SMD
Manufacturer Part number	ACES 51748-07502-005_P0.5mm-H8.5mm
Mating Connector	Any M.2 E key 2230 card standard interface device.
Pinout	Please refer to M.2 E key card standard for the pinout details.
Remarks	None

3.5.9. M.2 M key 2280

Function	M.2 M key
Location	J36/ J39
Description	Socket_M.2-Key M_75pin_90^{o}_SMD
Manufacturer Part number	FOXCONN 2E0BC21-S85BM-7H_P0.5mm-H8.5mm
Mating Connector	Any M.2 M key 2280 card standard interface device.
Pinout	Please refer to M.2 M-key card standard for the pinout details.
Remarks	J39 only support PCIe 2-lane

3.5.10. M.2 B key 3042/ 3052

Function	M.2 B key for 4G/ 5G module
Location	J9
Description	Socket_M.2-Key B_75pin_90^{o}_SMD
Manufacturer Part number	FOXCONN 2E0BC21-S85BB-7H_P0.5mm-H8.5mm
Mating Connector	Any M.2 B key card standard interface device.
Pinout	Please refer to M.2 B-key card standard for the pinout details.
Remarks	None

3.5.11. Mini card socket

Function	Mini Card (PCIe) interface
Location	J6
Description	Socket_MINI PCIE 52-pin
Manufacturer Part number	FOXCONN, AS0B221-S68Q 7H_H=6.8MM-062AL6
Mating Connector	Any Mini Card standard interface device.
Pinout	Please refer to Mini card standard for the pinout details.
Remarks	None

3.5.12. Gigabit Ethernet Connector

Function	1Gb single-port Ethernet connector, used to connect to the host system.
Location	J4
Description	JACK_RJ45*2_TRANSFOMER+LED_90°_DIP
Manufacturer Part number	JDKA1S826-G/D1_1G-LED L(G)+R(G/Y)
Mating Connector	Any standard 1Gb Ethernet mating connector can be applicable.
Pinout	Comply with Ethernet standards.
Remarks	None

3.5.13. QSFP connector

Function	QSFP connector
Location	J29
Description	OTHERS_CAGE_20.99*61.17mm_QSFP28-STYLE A
Manufacturer Part number	GM9_OTHERS_PRESS FIT-90°-W/O LED & HEATSINK
Mating Connector	Any standard QSFP connector con be applicable
Pinout	N/A
Remarks	None

3.5.14. USB 3.2 Gen2 Type A connector

Function	USB 3.2 Dual Port Type A Connector
Location	J8
Description	USB 3.2 Type-A female connector
Manufacturer Part number	GM9-HF_JACK_UEA11123-QHD6-4H_-55+85℃
Mating Connector	Any Standard Type-A interface cable or device.
Pinout	Please refer to USB 3.2 standard.
Remarks	None

3.5.15. Micro SIM card Slot

Function	Micro SIM card
Location	J10
Description	Socket Micro SIM_8pin_90°_SMD
Manufacturer Part number	FG-0271AAAG06A_PUSH PUSH 1.42H
Pinout	Refer to Micro SIM card standard Remark.
Note	Push Push type Inserting directing as below
Remarks	None

3.5.16. Euro Terminal Block

<table>
<tr><td>Function</td><td>General Purpose Input/ Output</td></tr>
<tr><td>Location</td><td>J21</td></tr>
<tr><td>Description</td><td>Expansion I/O Connector</td></tr>
<tr><td>Manufacturer Part number</td><td>ME252-3520-1</td></tr>
<tr><td>Mating Connector</td><td>2 x 10 EURO Terminal Block 1x CAN-FD</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Address JP7</th><th>Pin Name</th><th>Pin#</th><th>Pin#</th><th>Pin Name</th><th>Address JP7</th></tr>
<tr><td></td><td>5V</td><td>A1</td><td>B1</td><td>3V3</td><td></td></tr>
<tr><td></td><td>GND</td><td>A2</td><td>B2</td><td>GND</td><td></td></tr>
<tr><td>/dev/tty/AMA5</td><td>UART_TX_3V3 J58 (UF3_TXD)</td><td>A3</td><td>B3</td><td>I2C_GP8_DAT_3V3 (E60)</td><td>I2C-3</td></tr>
<tr><td>/dev/tty/AMA5</td><td>UART_RX_3V3 H58 (UF3_RXD)</td><td>A4</td><td>B4</td><td>I2C_GP8_CLK_3V3 (E60)</td><td>I2C-3</td></tr>
<tr><td></td><td>ISO_GND</td><td>A5</td><td>B5</td><td>GND</td><td></td></tr>
<tr><td></td><td>CANL0_ISO</td><td>A6</td><td>B6</td><td>CANL2</td><td></td></tr>
<tr><td></td><td>CANH0_ISO</td><td>A7</td><td>B7</td><td>CANH2</td><td></td></tr>
<tr><td></td><td>GND</td><td>A8</td><td>B8</td><td>CANL3</td><td></td></tr>
<tr><td></td><td>CANL1</td><td>A9</td><td>B9</td><td>CANH3</td><td></td></tr>
<tr><td></td><td>CANH1</td><td>A10</td><td>B10</td><td>GND</td><td></td></tr>
</table>
</td></tr>
<tr><td>Note</td><td>None</td></tr>
</table>

3.5.17. Expansion Header-1

Function	General Purpose Input/ Output
Location	J22
Type Description	Wafer_2x10pin
Manufacturer Part number	GM2_WAFER_JST_BM20B-SHLDS-G-TFT(LF)(SN)
Mating Connector	Any Standard interface cable or device
Pinout	

Address JP7	Pin Name	Pin #	Pin #	Pin Name	Address JP7
	3V3	1	2	5V	
	GND	3	4	GND	
I2C-9	I2C_GP9_DAT_3 V3 (C53)	5	6	UART_TX_3 V3	
I2C-9	I2C_GP9_CLK_3 V3 (A53)	7	8	UART_RX_3 V3	
Chip 2 gpio 127	GPIO27_PWM2	9	10	GND	
Chip 2 gpio 16	GPIO3_PV, 01	11	12	GPIO3_PJ, 07	Chip 2 gpio 71
Chip 2 gpio 112	GPIO3_PR, 02	13	14	GPIO3_KV, 00	Chip 2 gpio 72
Chip 2 gpio 113	GPIO3_PR, 03	15	16	GPIO3_KV, 01	Chip 2 gpio 73
Chip 2 gpio 114	GPIO3_PR,04	17	18	GPIO3_KV, 02	Chip 2 gpio 74
Chip 2 gpio 115	GPIO3_PR,05	19	20	GPIO3_KV, 03	Chip 2 gpio 75

Note	None

3.5.18. Expansion Header-2

Function	General Purpose Input/ Output
Location	J22
Type Description	Wafer_2x10pin
Manufacturer Part number	GM2_WAFER_JST_BM20B-SHLDS-G-TFT(LF)(SN)
Mating Connector	Any Standard interface cable or device
Pinout	

Address JP7	Pin Name	Pin #	Pin #	Pin Name	Address JP7
	3V3	1	2	5V	
	GND	3	4	GND	
I2C-11	I2C_GP11_DAT_3V3 (E26)	5	6	UARTH2_TX_3V3	
I2C-11	I2C_GP119_CLK_3V3 (E27)	7	8	UARTH2_RX_3V3	
Chip 2 gpio 128	GPIO36_PWM2	9	10	GND	
Chip 2 gpio 14	GPIO44_PWM5_3V3	11	12	GPIO3_PH, 06	Chip 2 gpio 62
Chip 2 gpio 21	GPIO3_PV, 06	13	14	GPIO3_PH, 07	Chip 2 gpio 63
Chip 2 gpio 22	GPIO3_PV, 07	15	16	GPIO3_PJ, 00	Chip 2 gpio 64
Chip 2 gpio 23	GPIO3_PW,00	17	18	GPIO3_PJ, 01	Chip 2 gpio 65
Chip 2 gpio 24	GPIO3_PW,01	19	20	GPIO3_PJ, 02	Chip 2 gpio 66

Note	None

3.5.19. Terminal Block 3-pin

<table>
<tr><td>Function</td><td>DC power input</td></tr>
<tr><td>Location</td><td>J33</td></tr>
<tr><td>Description</td><td>SOCKET_TERMINAL BLOCK_1*3PIN_90°_DIP</td></tr>
<tr><td>Manufacturer Part number</td><td>GM9_SOCKET_ME050-50803_GREEN-P5.0mm PIN L4.5mm</td></tr>
<tr><td>Mating Connector</td><td></td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>ACC</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><td>3</td><td>DC_IN (9V ~ 36V)</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.20. Input Power 4P

<table>
<tr><td>Function</td><td>ATX 4P</td></tr>
<tr><td>Location</td><td>J34</td></tr>
<tr><td>Description</td><td>WAFER_2x2PIN_4.2mm_90°_DIP</td></tr>
<tr><td>Manufacturer Part number</td><td>Fullglory FPWD-42R2-04NAT</td></tr>
<tr><td>Mating Connector</td><td>Follow ATX 4pin power standard</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>GND</td><td>3</td><td>12 – 54V Power</td></tr>
<tr><td>2</td><td>GND</td><td>4</td><td>12 – 54V Power</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.21. Input Power 6P

<table>
<tr><td>Function</td><td>DC power input</td></tr>
<tr><td>Location</td><td>J32</td></tr>
<tr><td>Description</td><td>WAFER_2*3PIN_4.2mm_180°_DIP-L3.5mm</td></tr>
<tr><td>Manufacturer Part number</td><td>GM1-HF_WAFER_ACES_56973-0060N-001_ATX POWER-NATURAL</td></tr>
<tr><td>Mating Connector</td><td>Follow ATX 6pin power standard</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>9 – 36V Power</td><td>4</td><td>GND</td></tr>
<tr><td>2</td><td>9 – 36V Power</td><td>5</td><td>GND</td></tr>
<tr><td>3</td><td>ACC</td><td>6</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.22. Board to Board connector

To camera board

Function	Board to board connector
Location	J20
Description	SAMTEC QSH-060-01-L-D-A-K-TR BTB-RECEPTACLE
Manufacturer Part number	SAMTEC QTH-060-03-H-A-D BTB-PLUG QTH-060-04-H-A-D BTB-PLUG
Mating Connector	Follow ATX 4pin power standard
Pinout	Comply with NVIDIA Dev. Kit pinout
Remarks	None

3.5.23. Coaxial connector

Function	40-pin coaxial connector for daughter board
Location	J12
Description	Wafer_40pin_0.5mm_90_SMD
Manufacturer Part number	I-PEX 20455-040E-12
Mating Connector	I-PEX 20453-240T-03
Pinout	Any standard coaxial connector interface cable or device.
Remarks	None

3.5.24. OOB board Connector

for optional OOB board

<table>
<tr><td>Function</td><td>OOB board connector</td></tr>
<tr><td>Location</td><td>J5</td></tr>
<tr><td>Description</td><td>WAFER_1*10PIN_1mm_180°_SMD</td></tr>
<tr><td>Manufacturer Part number</td><td>ACES 50228-01071-001</td></tr>
<tr><td>Mating Connector</td><td>ACES 50233-010H0H0-001</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th><th>Module Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>TXD0</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>2</td><td>TXD1</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>3</td><td>TX_EN</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>4</td><td>GND</td><td></td><td>GND</td></tr>
<tr><td>5</td><td>CLK_IN</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>6</td><td>GND</td><td></td><td>GND</td></tr>
<tr><td>7</td><td>RXD0</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>8</td><td>RXD1</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>9</td><td>CRS_DV</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>10</td><td>GND</td><td></td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>For optional OOB with NCSI board</td></tr>
</table>

3.5.25. OOB board Connector

for optional OOB board & Basic function

<table>
<tr><td>Function</td><td>OOB board connector (Basic function)</td></tr>
<tr><td>Location</td><td>J27</td></tr>
<tr><td>Description</td><td>WAFER_1*10PIN_1mm_180°_SMD</td></tr>
<tr><td>Manufacturer Part number</td><td>ACES 50228-01071-001</td></tr>
<tr><td>Mating Connector</td><td>ACES 50233-010H0H0-001</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th>Description</th><th>Module Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>GND</td><td></td><td>Ground</td></tr>
<tr><td>2</td><td>NC</td><td></td><td>-</td></tr>
<tr><td>3</td><td>UART2_RX (Debug UART)</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>4</td><td>UART2_TX (Debug UART)</td><td></td><td>GND</td></tr>
<tr><td>5</td><td>UART1_RX (Auto-link)</td><td></td><td>Input, 3.3V</td></tr>
<tr><td>6</td><td>UART1_TX (Auto-link)</td><td></td><td>GND</td></tr>
<tr><td>7</td><td>SOM_PWR_GOOD</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>8</td><td>SYS_RST</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>9</td><td>BUTTON_PWR</td><td></td><td>Output, 3.3V</td></tr>
<tr><td>10</td><td>+5V_STANDBY</td><td></td><td>Power, 5V</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>For optional OOB board</td></tr>
</table>

3.5.26. OOB board Jumper

<table>
<tr><td>Function</td><td>Jumper of OOB board</td></tr>
<tr><td>Location</td><td>J27/ J26/ J25</td></tr>
<tr><td>Description</td><td>WAFER_1*2PIN_1㎜_180°_SMD</td></tr>
<tr><td>Manufacturer Part number</td><td>ACES 50228-00271-001_WTB</td></tr>
<tr><td>Mating Connector</td><td>ACES 50233-010H0H0-001</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>J24</th><th>Description</th></tr>
<tr><td>1</td><td>Power</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><th>J26</th><th>Description</th></tr>
<tr><td>1</td><td>RESET</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><th>J25</th><th>Description</th></tr>
<tr><td>1</td><td>Recovery</td></tr>
<tr><td>2</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.27. Switch Button

<table>
<tr><td>Function</td><td>Switch Button</td></tr>
<tr><td>Location</td><td>SW7/ SW8</td></tr>
<tr><td>Description</td><td>4 SPST DIP switch</td></tr>
<tr><td>Manufacturer Part number</td><td>DIPTRONICS IN OFF-SWITCHING 0.025A/24VDC</td></tr>
<tr><td>Pinout</td><td>SW7
<table>
<tr><th>Pin #</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2">1</td><td>OFF</td><td>CAN0 Without terminal</td></tr>
<tr><td>ON</td><td>CAN0 With terminal</td></tr>
<tr><td rowspan="2">2</td><td>OFF</td><td>CAN1 Without terminal</td></tr>
<tr><td>ON</td><td>CAN1 With terminal</td></tr>
<tr><td rowspan="2">3</td><td>OFF</td><td>CAN2 Without terminal</td></tr>
<tr><td>ON</td><td>CAN2 With terminal</td></tr>
<tr><td rowspan="2">4</td><td>OFF</td><td>CAN3 Without terminal</td></tr>
<tr><td>ON</td><td>CAN3 With terminal</td></tr>
</table>
SW8
<table>
<tr><th>Pin #</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2">1</td><td>OFF</td><td>Auto Power</td></tr>
<tr><td>ON</td><td>Button Power</td></tr>
<tr><td rowspan="2">2</td><td>OFF</td><td>FAN PWM</td></tr>
<tr><td>ON</td><td>FAN Always</td></tr>
<tr><td rowspan="2">3</td><td>OFF</td><td>Always Powser ON disable</td></tr>
<tr><td>ON</td><td>Always Powser ON Enable</td></tr>
<tr><td rowspan="2">4</td><td>OFF</td><td>Ignore ACC for Development</td></tr>
<tr><td>ON</td><td>ACC Enable</td></tr>
</table></td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.28. Switch Button

<table>
<tr><td>Function</td><td>Switch Button</td></tr>
<tr><td>Location</td><td>SW9</td></tr>
<tr><td>Description</td><td>SW_DIP_NDSVM-02Q-T-R_SMD4</td></tr>
<tr><td>Manufacturer Part number</td><td>GM1-HF_SWITCH_IN OFF-SWITCHING 0.025A/24VDC</td></tr>
<tr><td>Pinout</td><td>
<table>
<tr><th>Pin #</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2">1</td><td>OFF</td><td>PCIe x8</td></tr>
<tr><td>ON</td><td>PCIe x ?</td></tr>
<tr><td rowspan="2">2</td><td>OFF</td><td>Mini card set as GPS</td></tr>
<tr><td>ON</td><td>Mini card set as PCIe</td></tr>
</table>
</td></tr>
<tr><td>Remarks</td><td>None</td></tr>
</table>

3.5.29. Power & Recovery Button

Function	Power & Recovery Control Button
Location	BSW1/ BSW3
Description	Button
Manufacturer Part number	Champway 12VDC/0.05A-160G-H1.8㎜-BLACK
Pinout	N/A
Remarks	None

3.5.30. AUDIO Jack

Function	MIC in/ Line-out
Location	J35
Description	Jack Phone *2 D35-black
Manufacturer Part number	GM1_JACK_PJD-035-87HAB
Pinout	Top: MIC in Bottom: Line-out
Remarks	None

3.5.31. JTAG Header

Function	JTAG
Location	J2
Description	2x5-pin 1.27mm pin-header
Manufacturer Part number	PH13-10VM1002CU8-06
Pinout	

Pin #	Description	Pin #	Description
1	TMS	2	+1.8V
3	TCK	4	GND
5	TDO	6	GND
7	TDI	8	GND
9	Reset_IN	10	GND

Remarks	None

Other Switches and Jumpers

Other switches and jumpers listed on the boards but not mentioned in this manual are reserved for the internal usage. They are not open to the client application.

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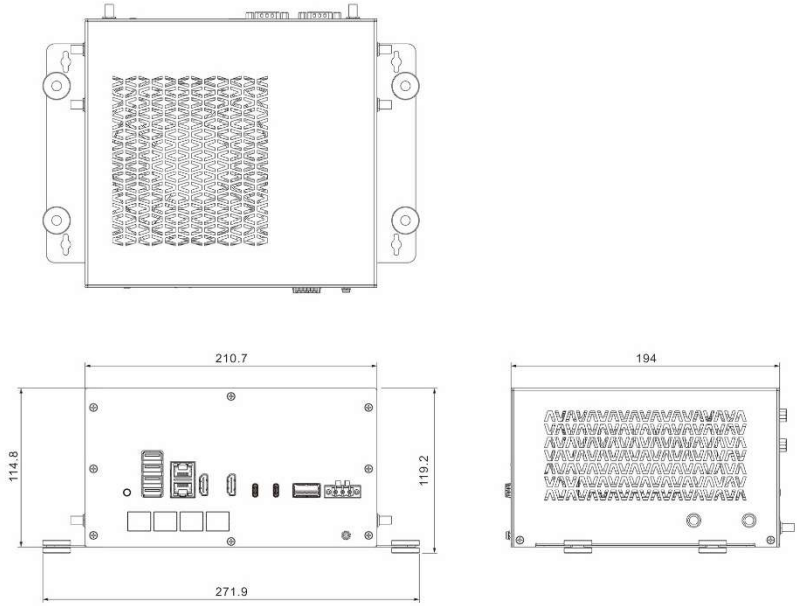
4. Engine of the Computer

4.1. Dimensions



Unit: mm

4.2. I/O & Functions

AEC-8x00 series provides HDMI & DP video output, USB 3.2 ports, GbE RJ-45 ports, PoE+ ports, GMSL ports, expansion header, and USB port for recovery.

Operating with NVIDIA® Jetson Thor T5000 module and the rich I/O functions. AEC-8x00 series is the perfect choice in building a compact, high performance AI Edge Computing platform for the intelligent video analytic applications.

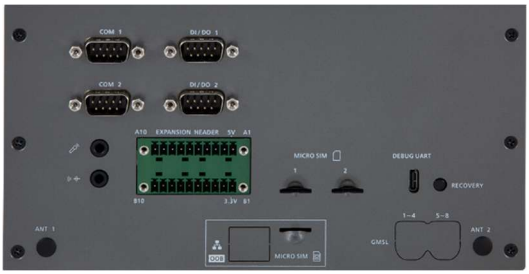
Front View

AEC-8000/ AEC-8100

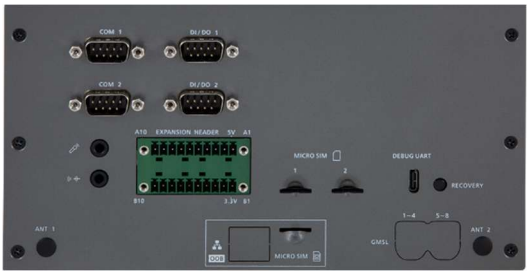
AEC-8200/ AEC-8400

Rear View

AEC-8000/ AEC-8200



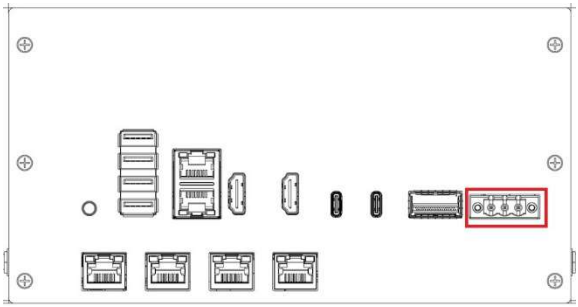
AEC-8100/ AEC-8400



The Power Button is a non-latched switch. To power on the system, press the power button. To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

4.3. Connectors

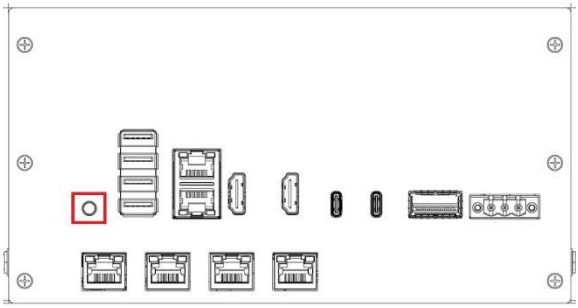
4.3.1. DC-IN connector



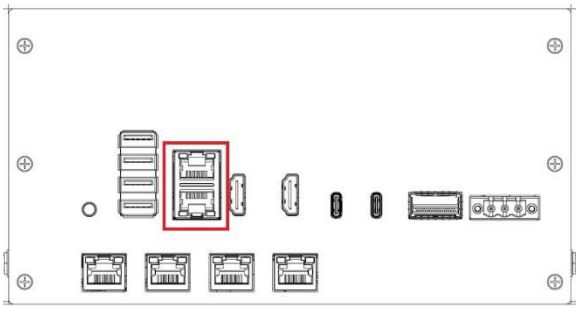
Power adapter in DC 3-pin terminal block.

Pin #	Description
1	ACC
2	GND
3	DC_IN (9V ~ 36V)

4.3.2. Power On button



4.3.3. LAN connector



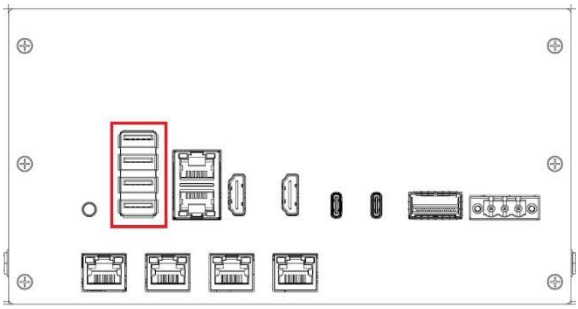
The pin-out of LAN is listed as follows:

Pin No.	10/100/1000Mbps
1	MDI0_P
2	MDI0_N
3	MDI1_P
4	MDI2_P
5	MDI2_N
6	MDI1_N
7	MDI3_P
8	MDI3_N

The LAN port is supported by standard RJ-45 connector with LED indicators to present Active / Link/ Speed status of the connection.

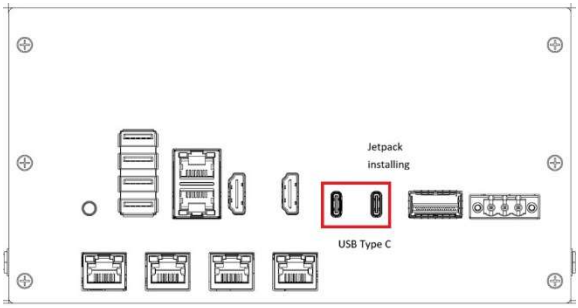
LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green	Off	Solid Green	Solid Orange
Left	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow

4.3.4. USB 3.2 ports



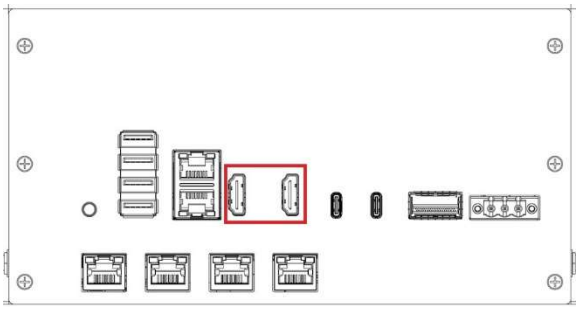
There are 4 USB 3.2 connectors available supporting up to 5Gb per second data rate in the front panel of AEC-8x00 series. It is also compliant with the requirements of Supper Speed (SS). High Speed (HS), Full Speed (FS) and Low Speed (LS).

4.3.5. USB Type C connector



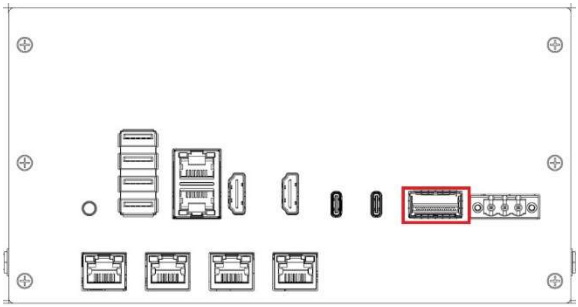
The AEC-8x00 series USB Recovery mode provides an alternate boot device (USB). In this mode, the system is connected to a host system and boots over USB. This is used when a new image needs to be flashed. USB0 must be available to use as USB Device for USB Recovery Mode.

4.3.6. HDMI ports



Onboard HDMI ports support HDMI V2.1 interface, connection supports up to 3840 x 2160 @60Hz.

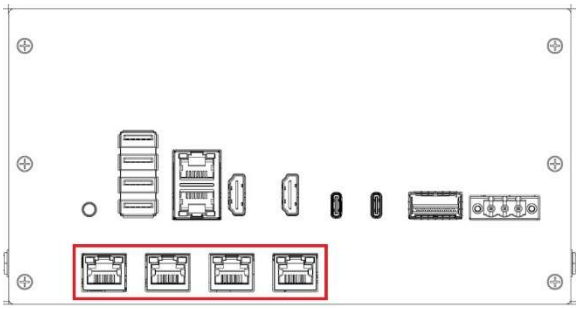
4.3.7. QSFP connector



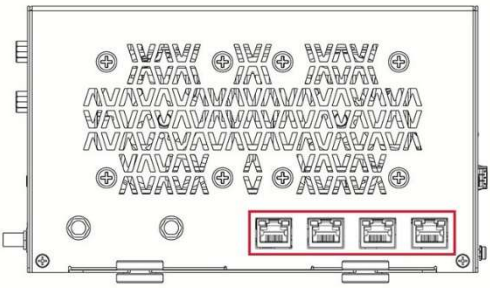
The AEC-8x00 Series provides a QSFP (Quad Small Form-factor Pluggable) connector, it is a compact, hot-pluggable network transceiver used for high-speed data communications. It combines four data channels into a single interface to support high density and bandwidth, typically running at speeds from 40Gbps (QAFP+) up to 400Gbps (QAFP-DD) in modern data centers.

4.3.8. PoE connectors (AEC-8200/ AEC-8400)

4 ports on front side



4 ports on left side.



The AEC-8200/ AEC-8400 provides a total of 8 PoE ports with RJ-45 connector, 4 positioned on the front side and 4 on the left side. It supports IEEE802.3at (PoE+) Power over Ethernet (PoE) connections delivering up to 25W/ 54V per port and 1000Base-T gigabit data signals over standard Ethernet Cat 5/ Cat 6 cable.

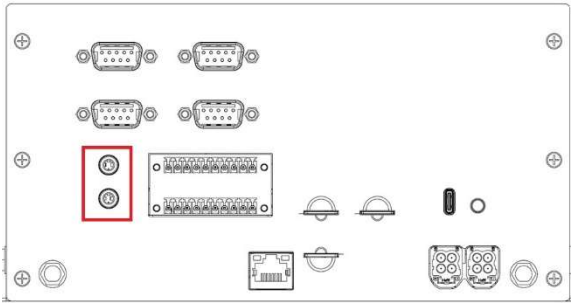
Each PoE connection is powered by Intel i350 Gigabit Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply Power to power devices, the dedicated LED with be lightened.

PS. Suggest to use PoE function when power input is over 24V.

The pin-outs of PoE ports are listed as follows:

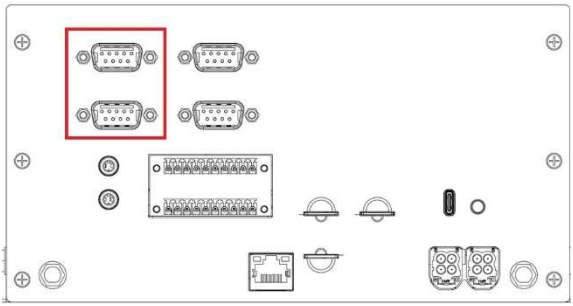
Pin No.	10/100Mbps	1000Mbps	PoE
1	E_TX+	MDI0_P	PoE+
2	E_TX-	MDI0_N	PoE+
3	E_RX+	MDI1_P	PoE-
4	NC	MDI2_P	NC
5	NC	MDI2_N	NC
6	E_RX-	MDI1_N	PoE-
7	NC	MDI3_P	NC
8	NC	MDI3_N	NC

4.3.9. AUDIO connector



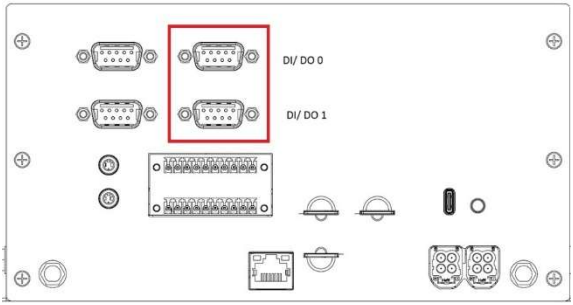
3.5mm phone jack.

4.3.10. COM ports



Serial ports can be configured for RS-232/ 422/ 485 with auto flow control communication. The default definition of COM ports is RS-232. If you want to change to RS-422 or RS-485, it must change COM mode by DIP SW.

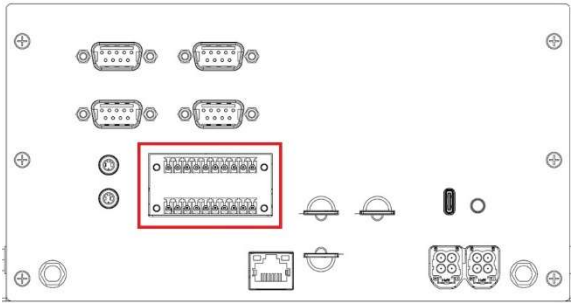
4.3.11. DI/ DO connector



GPIO connector pin-out

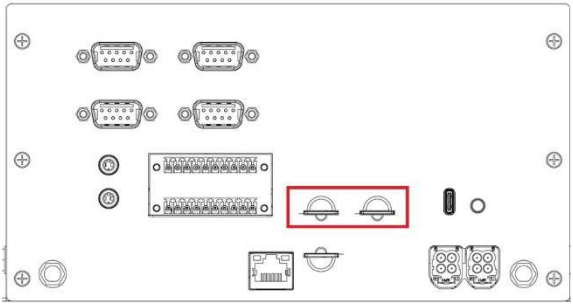
Pin No.	Description
1	GPIO_0
2	GPIO_1
3	GPIO_2
4	GPIO_3
5	GPIO_4
6	GPIO_5
7	GPIO_6
8	GPIO_7
9	NC

4.3.12. Expansion Header

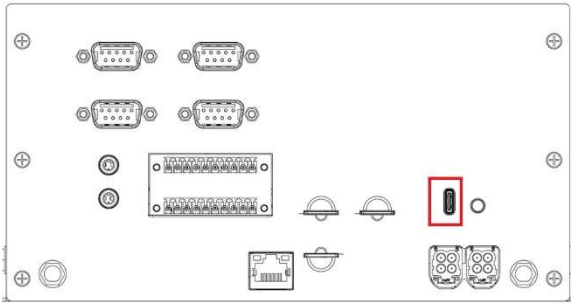


Pin No.	Description	Pin No.	Description
1	5V	11	3.3V
2	GND	12	GND
3	TX	13	I2C_DAT
4	RX	14	I2C_CLK
5	ISO_GND	15	GND
6	CNAL0_ISO	16	CANL2
7	CANH0_ISO	17	CANH2
8	GND	18	CAN;3
9	CANL1	19	CANH3
10	CANH1	20	GND

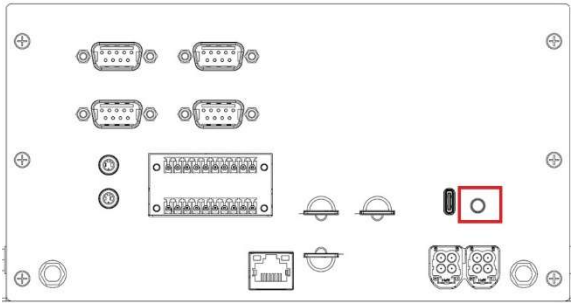
4.3.13. Micro SIM slots



4.3.14. Debug UART port

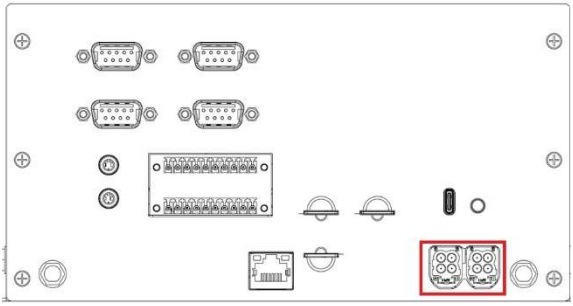


4.3.15. Force Recovery Button



Press the Button enter Force Recovery Mode. Button is held down while either system is first powered on, or by pressing & releasing reset button while Recovery button is pressed.

4.3.16. GMSL ports (AEC-8100/ AEC-8400)



There are eight FAKRA connectors in the rear side of AEC-8100/ AEC-8400. Each camera connects to the AEC-8100/ AEC-8400, break out into a single FAKRA connector via 4-in-1 cable. Using GMSL2 (Gigabit Multimedia Seral Link) connections, the cameras are connected to a two-port deserializer. The output of the deserializer is MIPI CSI-2.