Jetson Platform

AIB-AT78-1-A1

AIB-AT68-1-A1

USER MANUAL

www.aetina.com

Document Change History

Version	Date	Description
V1.0	2026/06/10	Preliminary version.

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Version 1.0

Acknowledgements

Customer Support Overview

Contact your distributor, sales representative, or Aetina's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Visit the Aetina website at https://www.Aetina.com/support-warranty-policy.php where you can find the latest information about the product.

Contact Information

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Product Warranty (2 years)

Aetina warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Aetina, or which have been subject to misuse, abuse, accident or improper installation. Aetina assumes no liability under the terms of this warranty as a consequence of such events.

Because of Aetina's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Aetina product is defective, it will be repaired or replaced at no charge during the warranty period. For out of warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Aetina products used other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy of the proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

ESD Warning

This product, like all electronic products, uses the product that can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the devices are not damaged. Damage due to inappropriate handling is not covered by the warranty. The following precautions must be taken:

- Do not open the protective conductive packaging until you have read the following and are at an approved anti-static workstation.
- If working on a prototyping board, use a soldering iron or station that is marked as ESD-safe.
- Always disconnect the product from the prototyping board when it is being worked on.
- Always discharge yourself by touching a grounded bare metal surface or approved anti-static mat before picking up an ESD - sensitive electronic component.
- Use an approved anti-static mat to cover your work surface.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references:

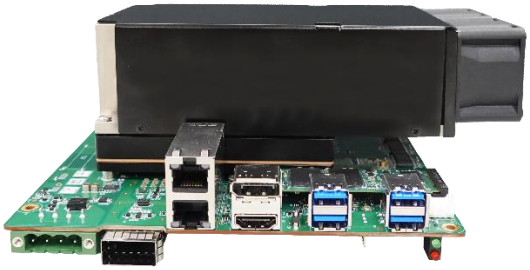
1. All cautions and warnings on the equipment should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
6. Always completely disconnect the power before working on the system's hardware.
7. Keep this equipment away from humidity.
8. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
9. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
10. Be sure that the room in which you choose to operate your system has adequate air circulation. Ensure that the chassis cover is secure.
11. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If any of the following situations arises, please contact our service personnel:
    - Damaged power cord or plug
    - Liquid intrusion to the device
    - Exposure to moisture
    - Device is not working as expected or in a manner as described in this manual
    - The device is dropped or damaged
    - Any obvious signs of damage displayed on the device

Contents

1. Introduction

AIB-AT78/AT68-1-A1 supports NVIDIA Jetson Thor series modules, and you can quickly emulate the functionality of your desired end product for software development and hardware verification. To build a functional prototype of your target system you will need:

- NVIDIA Jetson Thor T5000/T4000 module
- Carrier board
- Power adaptor



1.1. Features

- NVIDIA Blackwell architecture GPU
- AI Power up to 2070 FP4/TFLOPS
- Support QSFP28 up to 100Gbps
- Support Dual 10GbE LAN ports
- Support GbE LAN port (Optional EtherCAT support)
- 4 x USB 3.2 Gen 2 Type-A
- Wide range DC-in voltage

1.2. Specifications

■ Carrier Board Specifications

Specification	AIB-AT78-1-A1	AIB-AT68-1-A1
Module Compatibility	NVIDIA Jetson Thor T5000	NVIDIA Jetson Thor T4000
AI Performance	2070 FP4 TFLOPS 1035 FP8 TFLOPS	1200 FP4 TFLOPS
GPU	Blackwell GPU, 2560 NVIDIA® CUDA® cores | 5th GEN Tensor cores	Blackwell GPU, 1536 NVIDIA® CUDA® cores | 5th GEN Tensor cores
CPU	14-Core ARM Neoverse V3AE (64-bit)	12-Core ARM Neoverse V3AE (64-bit)
Memory	128GB 256-bit LPDDR5X	64GB 256-bit LPDDR5X
Storage	NVMe 1TB	
Display	1 x DP 1.4a (up to 4K@60) 1 x HDMI 2.0b Type-A (up to 4K@60)	
TPM	-	
RTC	RTC Battery CR2032	
Audio	Line in, headphone	
Camera Input	1 x 120pin MIPI	
LAN	1 x 1GbE, RJ45 LAN port (optional EtherCAT support) 2 x 10GbE, RJ45 LAN ports	
USB	4 x USB 3.2 Gen 2, Type-A 1 x OTG, USB 2.0, Type-C (OTG only)	
I/O Interfaces	1 x 100GbE, QSFP28 (up to 4 x 25GbE) 1 x HD audio-in/out 2 x RS232/RS422/RS485 4 x CAN FD (isolated) 4 x Digital input/Digital out @3.3V 2 x UART @ 3.3V 2 x I^2C @ 3.3V 1 x 12V DC output @ 1.5A 1 x 5V DC output @ 1.5A 1 x 3.3V DC output @ 1.5A	1 x 75GbE, QSFP28 (up to 3 x 25GbE) 1 x HD audio-in/out 2 x RS232/RS422/RS485 4 x Digital input/Digital out @3.3V 2 x UART @ 3.3V 2 x I^2C @ 3.3V 1 x 12V DC output @ 1.5A 1 x 5V DC output @ 1.5A 1 x 3.3V DC output @ 1.5A

Expansion	1 x M.2 B-Key 3052 (LTE/4G/5G, USB 3.0) 1 x M.2 M-Key 2280 (NVMe, PCIe Gen5 x4) 1 x M.2 E-Key 2230 (Wi-Fi/BT, PCIe Gen5 x1) 1 x microSIM card socket 1 x OOB (optional; requires module support and software customization.)	
MISC. Function	1 x Power button, 1 x Reset button, 1 x Recovery button	
Power Consumption	Idle: 33W	Idle: 30W
	Full loading: 170.11 W	Full loading: 114.48 W
Power Input / Connector	9V ~ 48V Terminal Block	
Dimension (W x D x H)	187.4 x 140.2 x 42.8mm (7.38 x 5.52 x 1.68 inch) (w/o fan sink) 213.7 x 140.2 x 83.44mm (8.41 x 5.52 x 3.29 inch) (with fan sink)	
Net Weight	1.485kg	1.485kg
Vibration	ISTA 2A 2022 , Random, 1-200Hz	ISTA 2A 2022 , Random, 1-200Hz
Shock	TBD	TBD
Temperature	Operating Temp.: -25°C ~ +70°C (-13°F ~ +158°F) Storage Temp.: -40°C ~ +85°C (-40°F ~ +185°F)	
Humidity	95% @ 40°C relative humidity, non-condensing	
Software Support	Linux (supports NVIDIA Jetpack™ 7.1 and above)	
Certification	CE, FCC Class A, UKCA	

2. Hardware Information

2.1. Connectors, LEDs, and Switches Reference Designators

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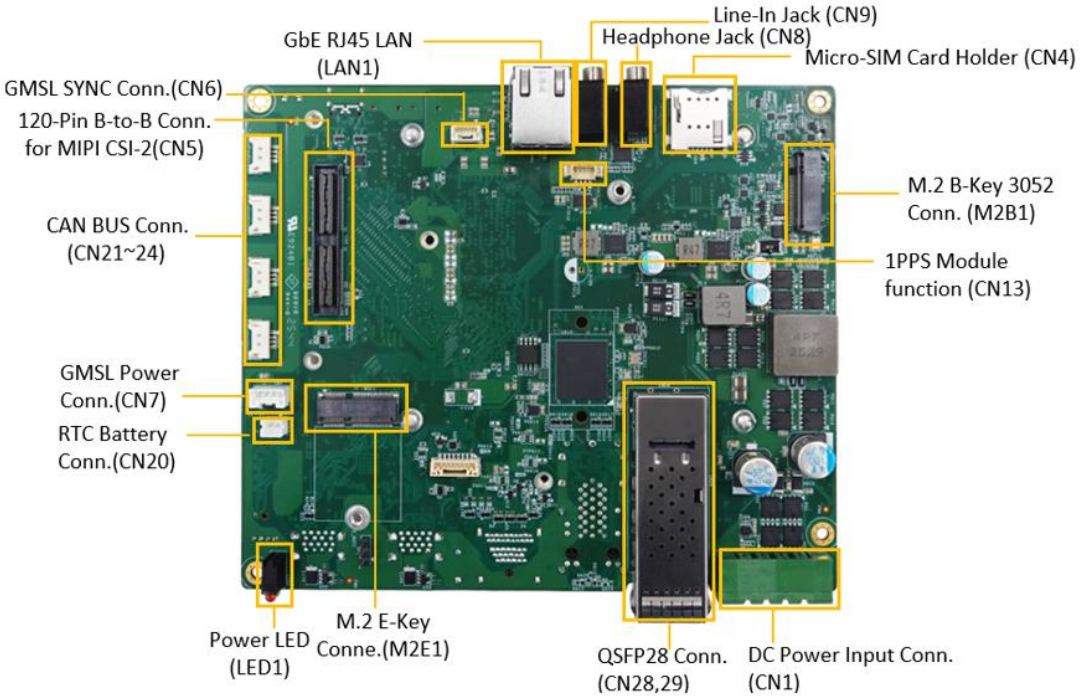
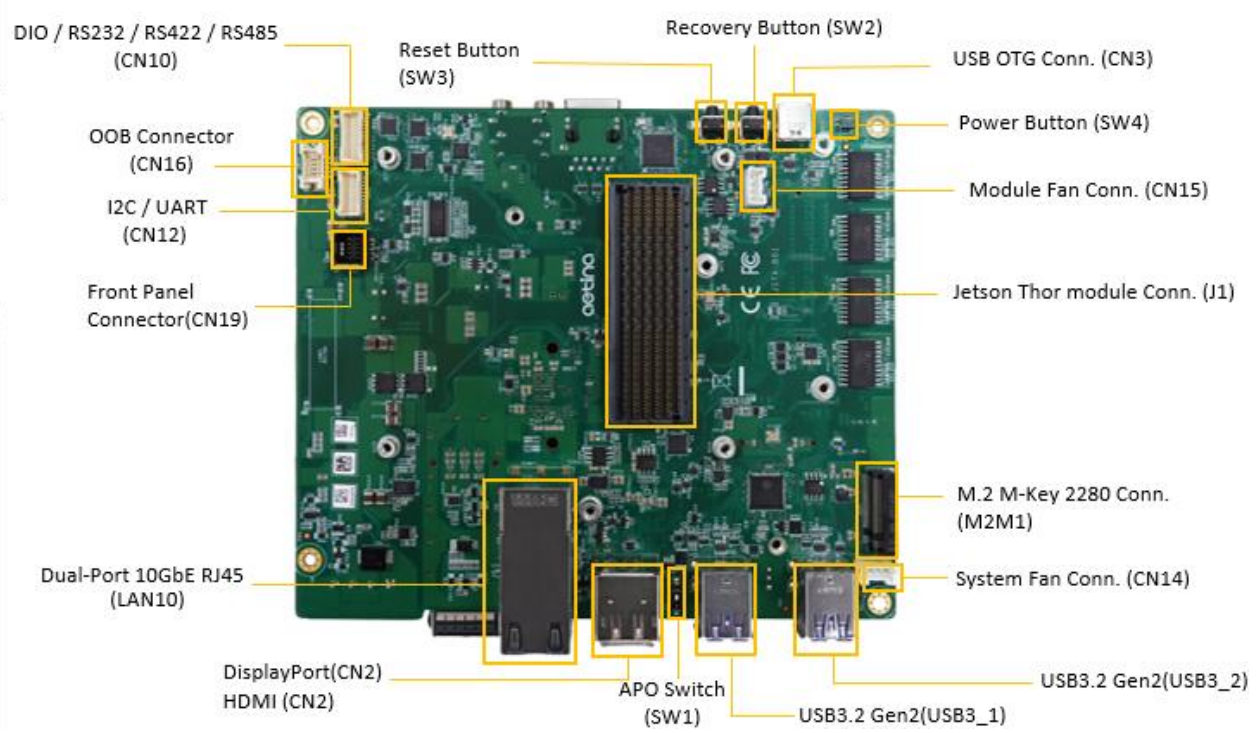


Button



2.2. Reference Designators (Connectors, LEDs, Switches)

Category	Reference Designator	Specification
SOM	J1	Jetson Thor Module Connector
Display	CN2	DisplayPort 1.4a Connector
	CN2	HDMI 2.0b Type-A Connector
USB	CN3	USB OTG Type-C Connector
	USB3_1	Dual-Port USB 3.2 Gen 2 Type-A Connector #1
	USB3_2	Dual-Port USB 3.2 Gen 2 Type-A Connector #2
LAN	LAN1	1GbE RJ45 LAN Connector (Optional EtherCAT support)
	LAN10	Dual-Port 10GbE RJ45 LAN Connector #1 & #2
	CN28, CN29	QSFP Connector
Miscellaneous	CN10	Miscellaneous I/O Connector (Supports DIO / RS232 / RS422 / RS485)
	CN12	Miscellaneous I/O Connector (Supports I^2C / UART)
	CN19	Front Panel Connector
	CN13	1PPS Module Function
	JP1	Debug UART
CAN	CN21	CAN BUS (CAN FD, isolated) Connector #1
	CN22	CAN BUS (CAN FD, isolated) Connector #2
	CN23	CAN BUS (CAN FD, isolated) Connector #3
	CN24	CAN BUS (CAN FD, isolated) Connector #4
GMSL	CN6	GMSL SYNC Connector
	CN7	GMSL Power Connector
Audio	CN9	Line-In Jack
	CN8	Headphone Jack
Power	CN1	DC Power Input Connector
	SW1	Auto Power-On (APO) Switch

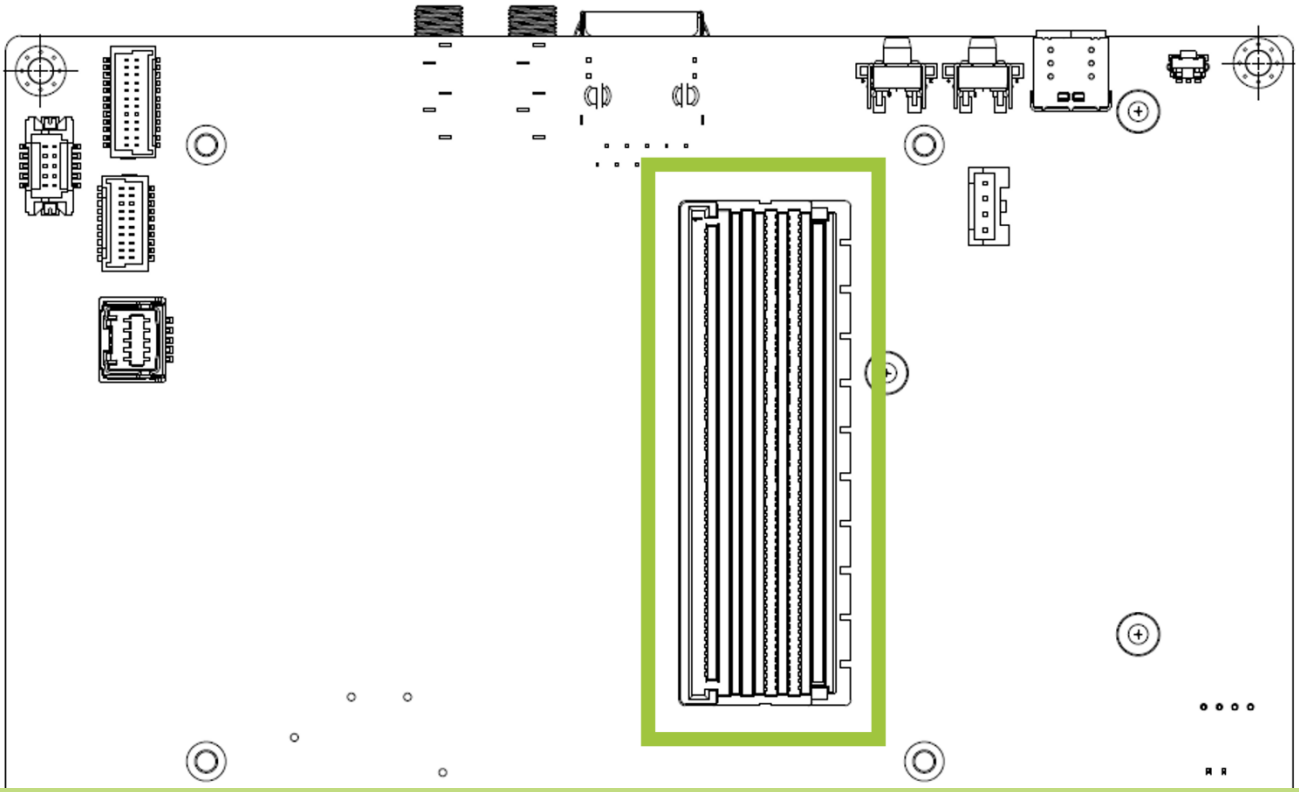
Internal Connector	M2B1	M.2 B-Key 3052 Connector
	M2M1	M.2 M-Key 2280 Connector
	M2E1	M.2 E-Key 2230 Connector
MIPI	CN5	120-Pin board to board connector for MIPI CSI-2
Fan	CN14	System Fan Connector
	CN15	Module Fan Connector
RTC	CN20	RTC Battery Connector
LED	LED1	Power LED
Socket	CN4	micro SIM Card Socket
Button	SW2	Recovery Button
	SW3	Reset Button
	SW4	Power Button
Optional	CN16	OOB Connector (Out-of-Band, Optional)

2.3. Connectors, LEDs, and Switches – Specifications

Here are the connectors and Pinout information of AIB-AT78-1-A1 / AIB-AT68-1-A1 carrier board below.

2.3.1. SOM

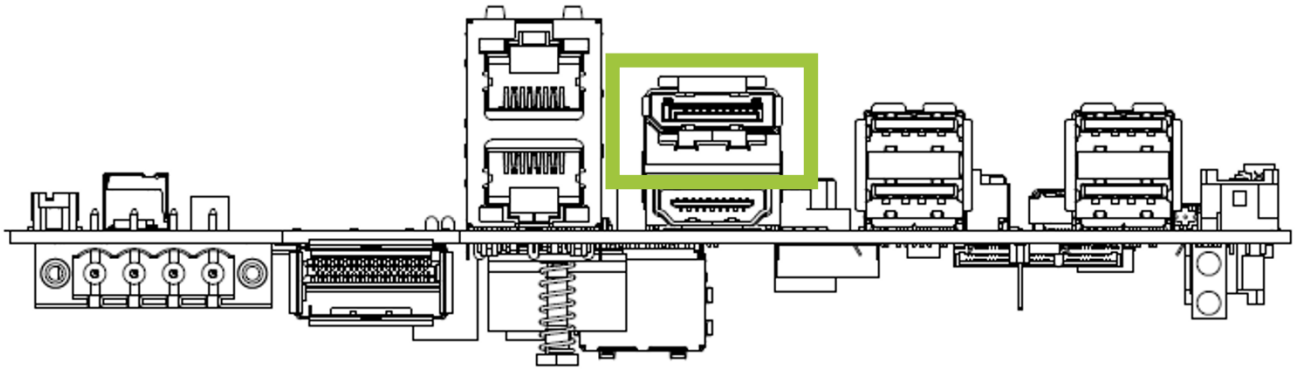
■ Jetson Thor Module Connector



Property	Specification
Reference Designator	J1
Connector	Jetson Thor module connector
Pinout	Refer to the NVIDIA Jetson Thor System-on-Module specification for detailed definitions

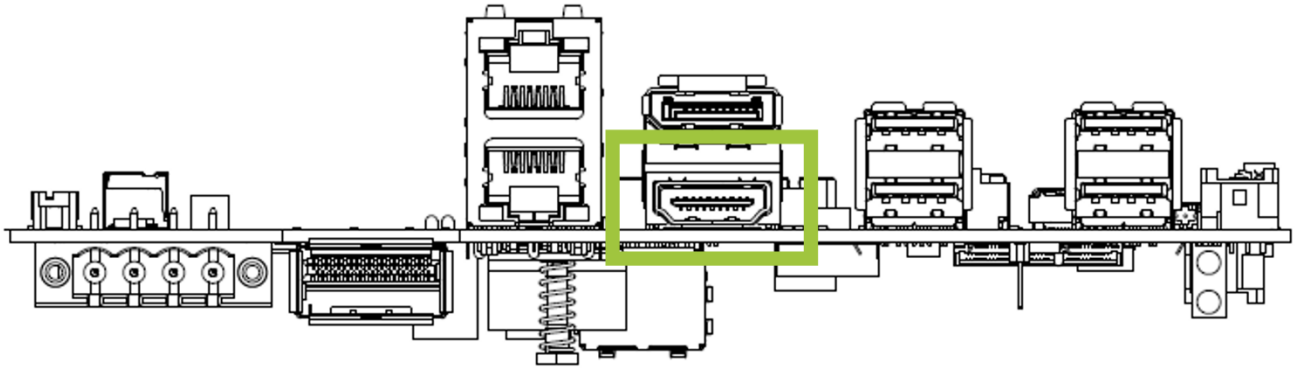
2.3.2. Display

■ DisplayPort 1.4a Connector



Property	Specification
Reference Designator	CN2
Connector	DP female connector
Pinout	Pin definition follows the DP specification
Notes	Resolution up to 4K@60Hz

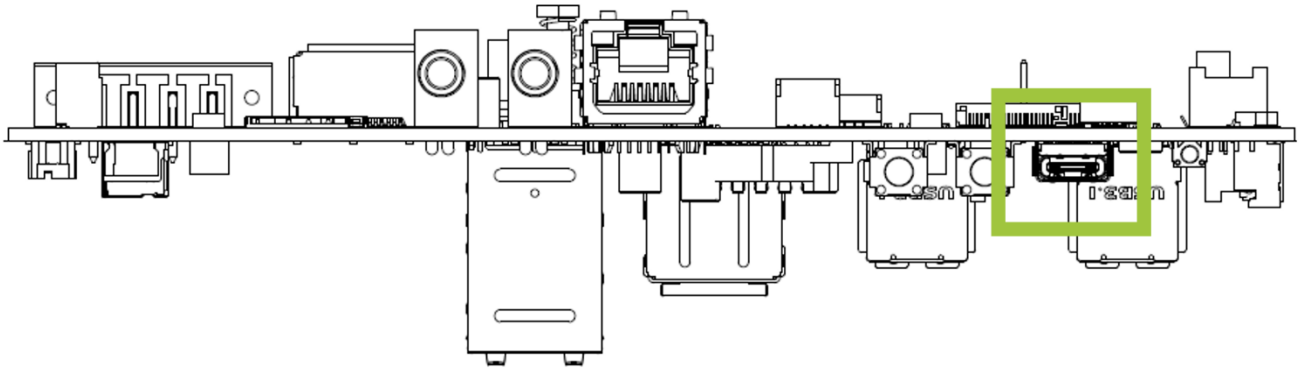
HDMI 2.0b Type-A Connector



Property	Specification
Reference Designator	CN2
Connector	HDMI Type-A female connector
Pinout	Pin definition follows the HDMI specification
Notes	Resolution up to 4K@60Hz

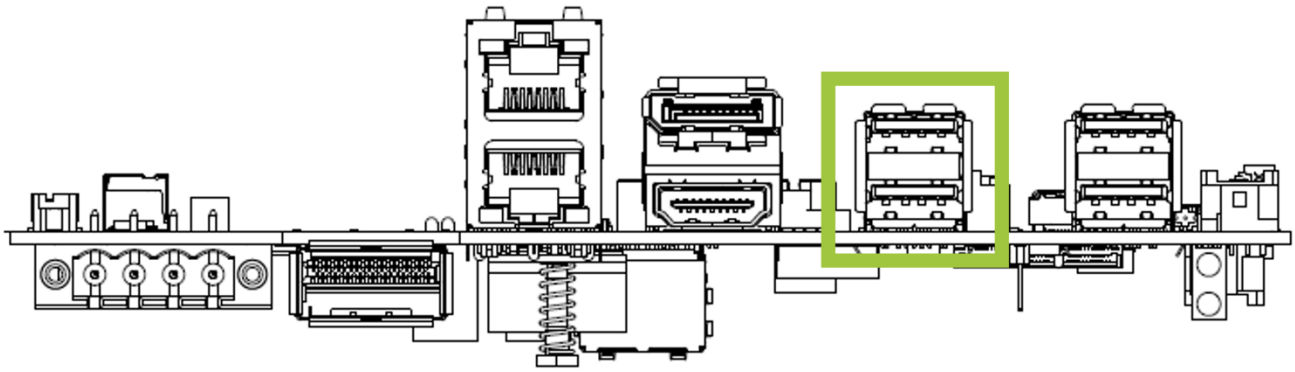
2.3.3. USB

■ USB OTG Type-C Connector



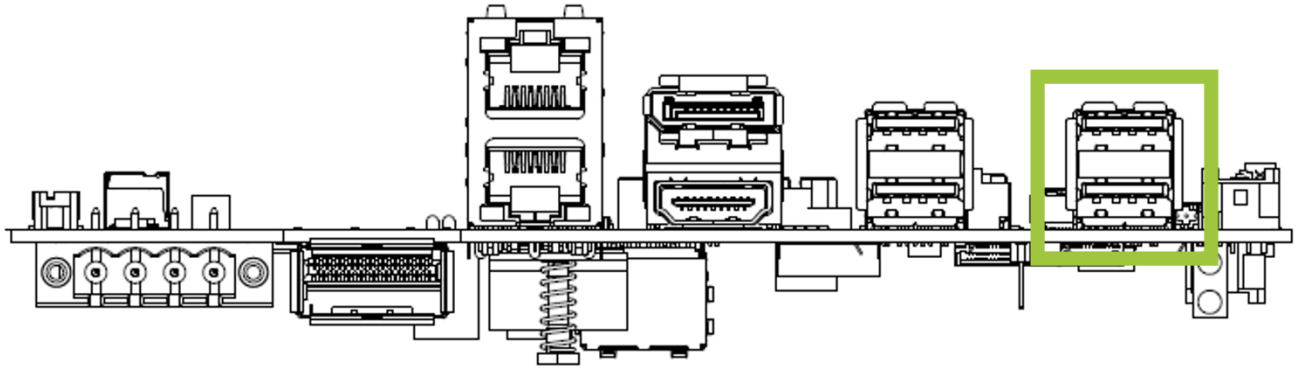
Property	Specification
Reference Designator	CN3
Connector	USB Type-C connector
Pinout	Please refer to USB standard
Notes	USB 2.0 OTG Type-C

Dual-port USB 3.2 Gen 2 Type-A Connector #1



Property	Specification
Reference Designator	USB3_1
Number	#1
Connector	USB Type-A connector
Pinout	Pin definition follows the USB specification
Notes	Supports up to 10Gbps per port. When multiple devices are connected, bandwidth is shared and actual data rates may vary.

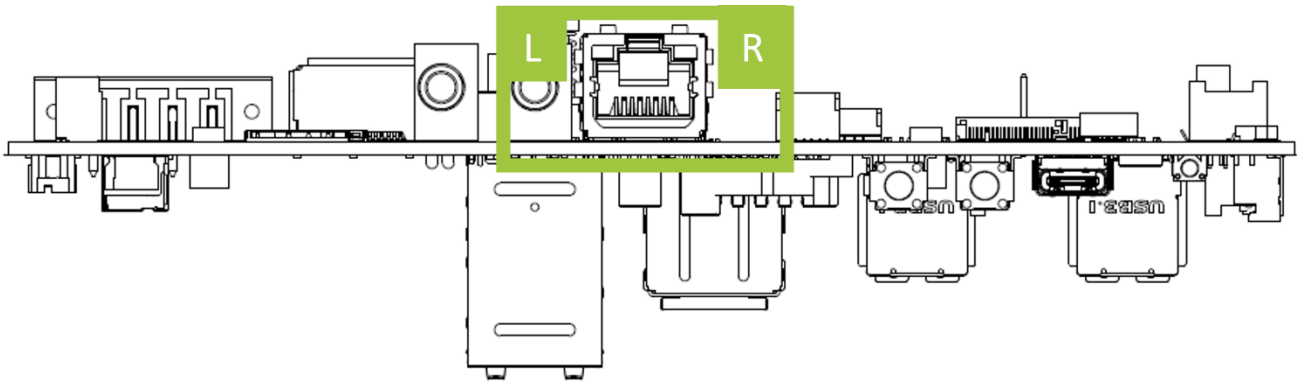
Dual-port USB 3.2 Gen 2 Type-A Connector #2



Property	Specification
Reference Designator	USB3_2
Number	#2
Connector	USB Type-A connector
Pinout	Pin definition follows the USB specification
Notes	Supports up to 10Gbps per port. When multiple devices are connected, bandwidth is shared and actual data rates may vary.

2.3.4. LAN

■ 1GbE RJ45 LAN Connector

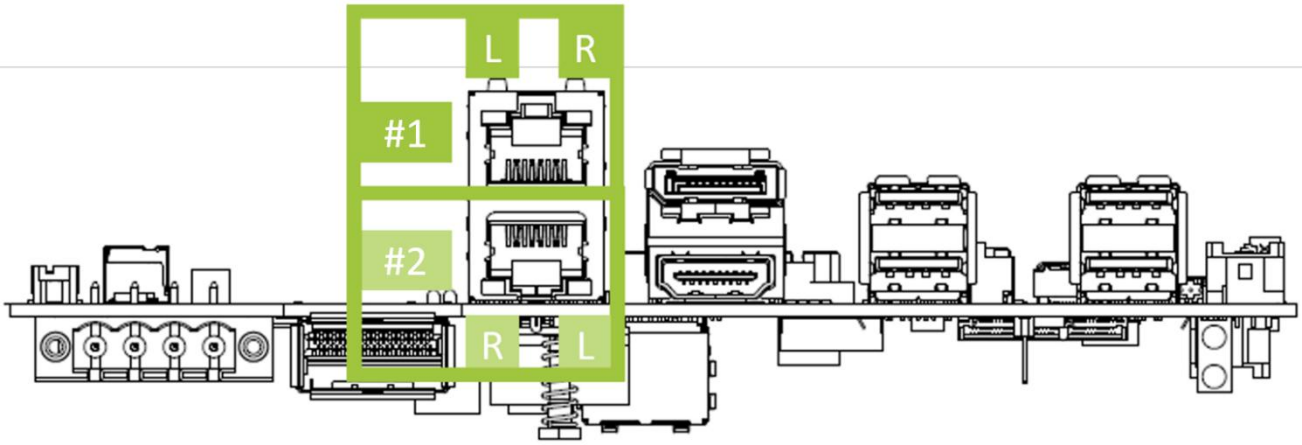


Property	Specification
Reference Designator	LAN1
Connector	RJ-45 connector
Pinout	Please refer to Ethernet standard
LAN Source	Intel Ethernet controller
Notes	GbE RJ45 LAN port (Optional EtherCAT support; requires software customization.)

LAN LED Indicators

LAN	Function	Color	Status	Description
L (Left)	Link Status	Green	ON	Link established
			Blinking	Data activity
			OFF	No link
R (Right)	Link Speed	Green	ON	1 Gbps
		Orange	ON	100 Mbps
		-	OFF	10 Mbps

Dual-port 10GbE RJ45 LAN Connector #1

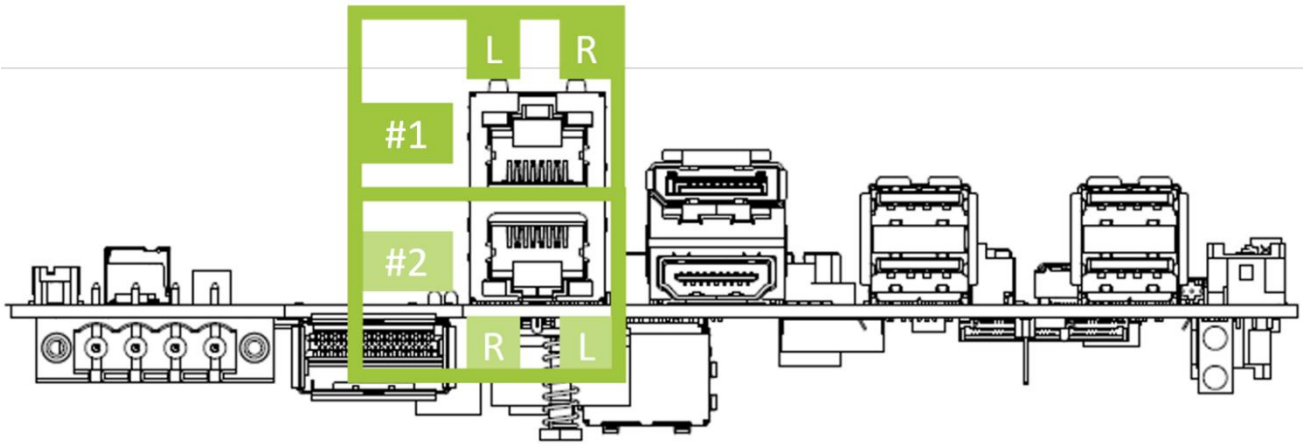


Property	Specification
Reference Designator	LAN10
Connector	RJ-45 connector
Pinout	Pin definition follows the RJ45 specification
LAN Source	Intel Ethernet controller

LAN LED Indicators

LAN	Function	Color	Status	Description
L (Left)	Link Status	Green	ON	Link established
			Blinking	Data activity
			OFF	No link
R (Right)	Link Speed	Green	ON	10 Gbps
		Orange	ON	1 Gbps / 2.5 Gbps / 5 Gbps
		-	OFF	100 Mbps

Dual-port 10GbE RJ45 LAN Connector #2

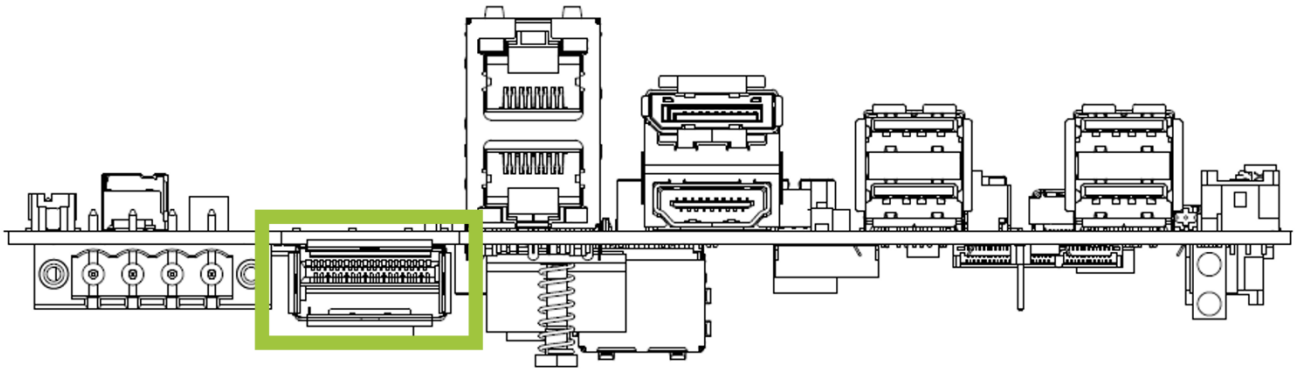


Property	Specification
Reference Designator	LAN10
Connector	RJ-45 connector
Pinout	Pin definition follows the RJ45 specification
LAN Source	Intel Ethernet controller

LAN LED Indicators

LAN	Function	Color	Status	Description
L (Left)	Link Status	Green	ON	Link established
			Blinking	Data activity
			OFF	No link
R (Right)	Link Speed	Green	ON	10 Gbps
		Orange	ON	1 Gbps / 2.5 Gbps / 5 Gbps
		-	OFF	100 Mbps

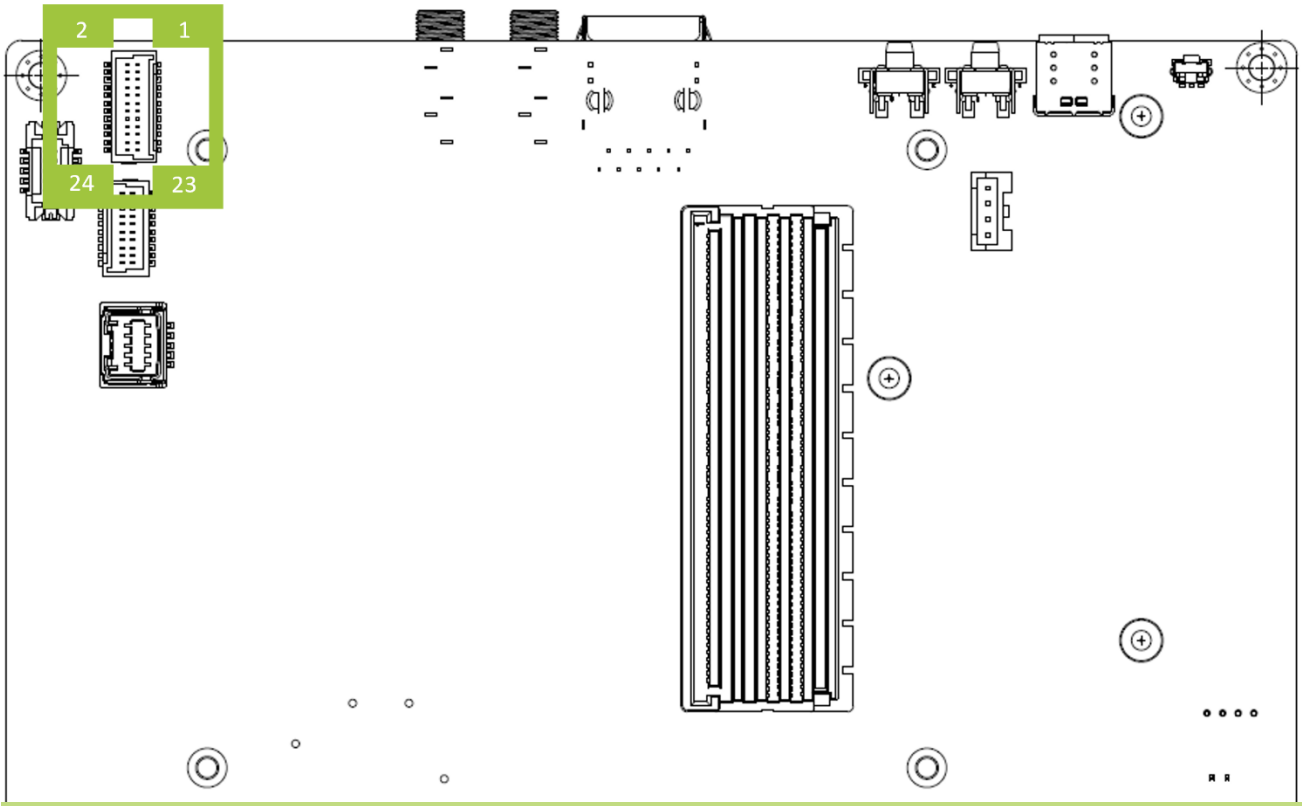
QSFP28 Connector



Property	Specification
Reference Designator	CN28, CN29
Connector	QSFP28 connector
Pinout	Refer to the QSFP specification for detailed definitions
Notes	▪ QSFP28 connector supporting up to 4x 25 GbE (100Gbps data rate), depending on the installed module and system configuration. ▪ Jetson T5000 (AIB-AT78) has four integrated Multi-Gigabit Ethernet (MGBE) controllers which can support up to 100 Gbps of total bandwidth. ▪ Jetson T4000 (AIB-AT68) has three integrated MGBE controllers which can support up to 75 Gbps of total bandwidth.

2.3.5. Miscellaneous

■ Miscellaneous I/O Connector (Supports DIO / RS232 / RS422 / RS485)



Property	Specification
Reference Designator	CN10
Connector	2x12 Pin, 1.0 mm Pitch Wafer (Board-to-Wire Header)
Notes	Supports 4 x DI / 4 x DO, 2 x RS-232/422/485*

Pin #	Signal	Pin Config	Pin #	Signal	Pin Config
1	GND		2	VCC_3V3 @ 1A	
3	DO0_CN	PL.06 / 3V3 (default); 5V (optional) / Output / Pull-down	4	DI0_CN	PR.02 / 3V3 (default); 5V (optional) / Input / No-pull
5	DO1_CN	PV.07 / 3V3 (default); 5V (optional) / Output / Pull-down	6	DI1_CN	PR.03 / 3V3 (default); 5V (optional) / Input / No-pull

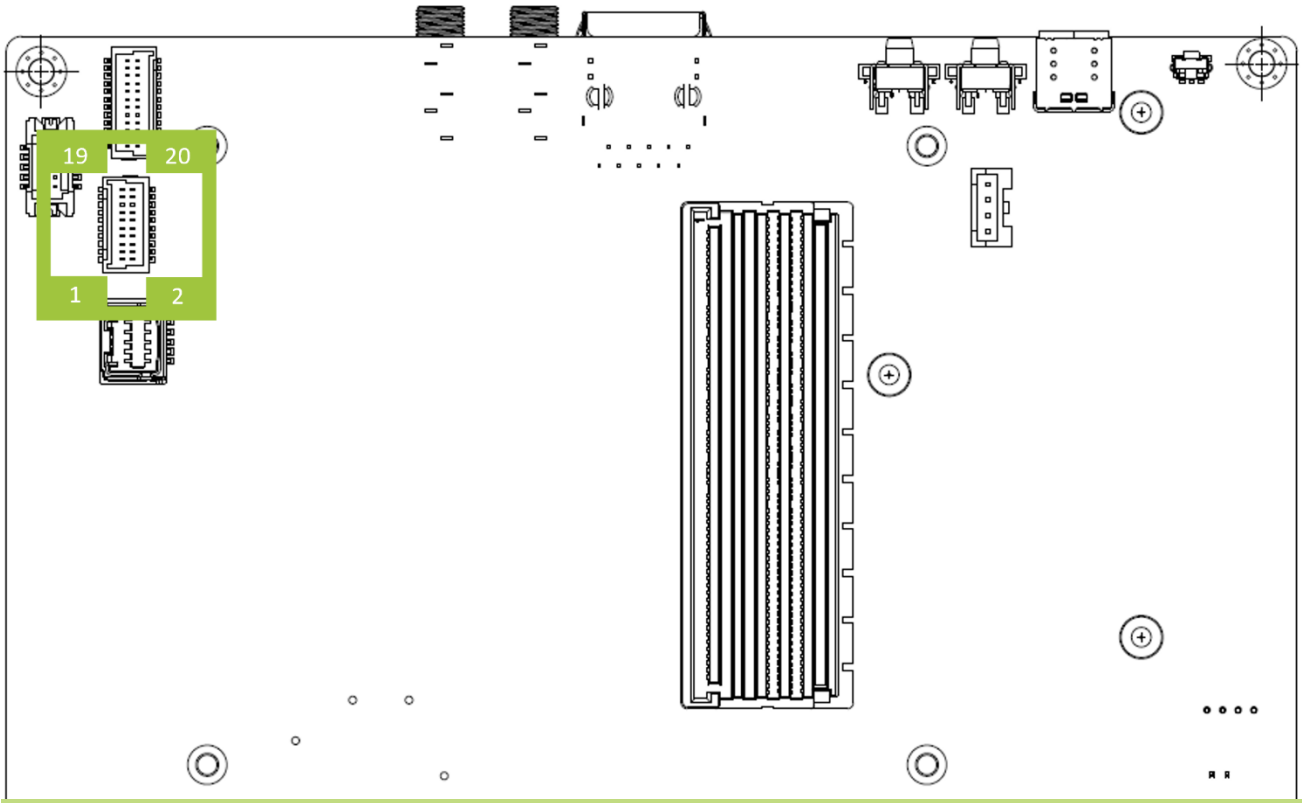
7	DO2_CN	PW.00 / 3V3 (default); 5V (optional) / Output / Pull-down	8	DI2_CN	PR.04 / 3V3 (default); 5V (optional) / Input / No-pull
9	DO3_CN	PV.01 / 3V3 (default); 5V (optional) / Output / Pull-down	10	DI3_CN	PR.05 / 3V3 (default); 5V (optional) / No-pull
11	RS2_DCDN (TX－)	ttyFIN1	12	RS1_DCDN (TX－)	ttyFIN0
13	RS2_SINN (TX＋)		14	RS1_SINN (TX＋)	
15	RS2_RTSN		16	RS1_RTSN	
17	RS2_SOUTN (RX＋)		18	RS1_SOUTN (RX＋)	
19	RS2_CTSN		20	RS1_CTSN	
21	RS2_DTRN (RX－)		22	RS1_DTRN (RX－)	
23	GND		24	GND	

*This connector allows users to configure serial interfaces through pin definition.

By selecting the appropriate pins, up to two ports can be implemented as RS-232, RS-422, or RS-485 in any combination.

Serial interface	First Port		Second Port	
	PIN #	Signal	PIN #	Signal
RS-232	13	SINN	14	SINN
	17	SOUTN	18	SOUTN
	15	RTSN	16	RTSN
	19	CTSN	20	CTSN
RS-422	11	TX－	12	TX－
	13	TX＋	14	TX＋
	17	RX＋	18	RX＋
	21	RX－	22	RX－
RS-485	11	TX－	12	TX－
	13	TX＋	14	TX＋

Misc (Miscellaneous) I/O Connector (Supports I²C / UART)

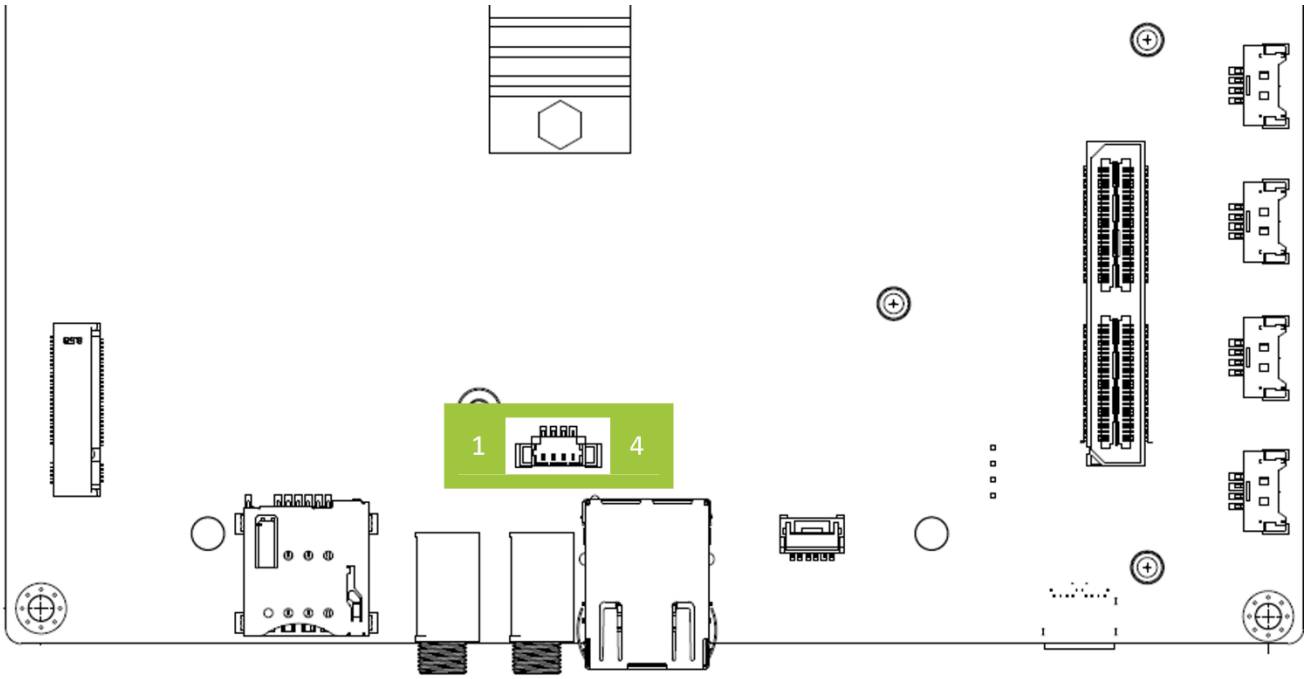


Property	Specification
Reference Designator	CN12
Connector	2x10 Pin, 1.0 mm Pitch Wafer (Board-to-Wire Header)
Notes	Supports 2 x I²C / 2 x UART

Pin #	Signal	Pin Config	Pin #	Signal	Pin Config
1	GND	I2C12	2	GND	I2C9
3	I2C3_3V3_CLK		4	I2C5_3V3_CLK	
5	I2C3_3V3_DAT		6	I2C5_3V3_DAT	
7	VCC_3V3		8	VCC_3V3	
9	VCC_3V3	ttyAMA5	10	VCC_3V3	ttyAMA10
11	UART2_RXD_CN2		12	UART1_RXD_CN1	
13	UART2_RTS_N_CN2		14	UART1_RTS_N_CN1	
15	UART2_TXD_CN2		16	UART1_TXD_CN1	

17	UART2_CTS_N_CN2		18	UART1_CTS_N_CN1	
19	GND		20	GND	

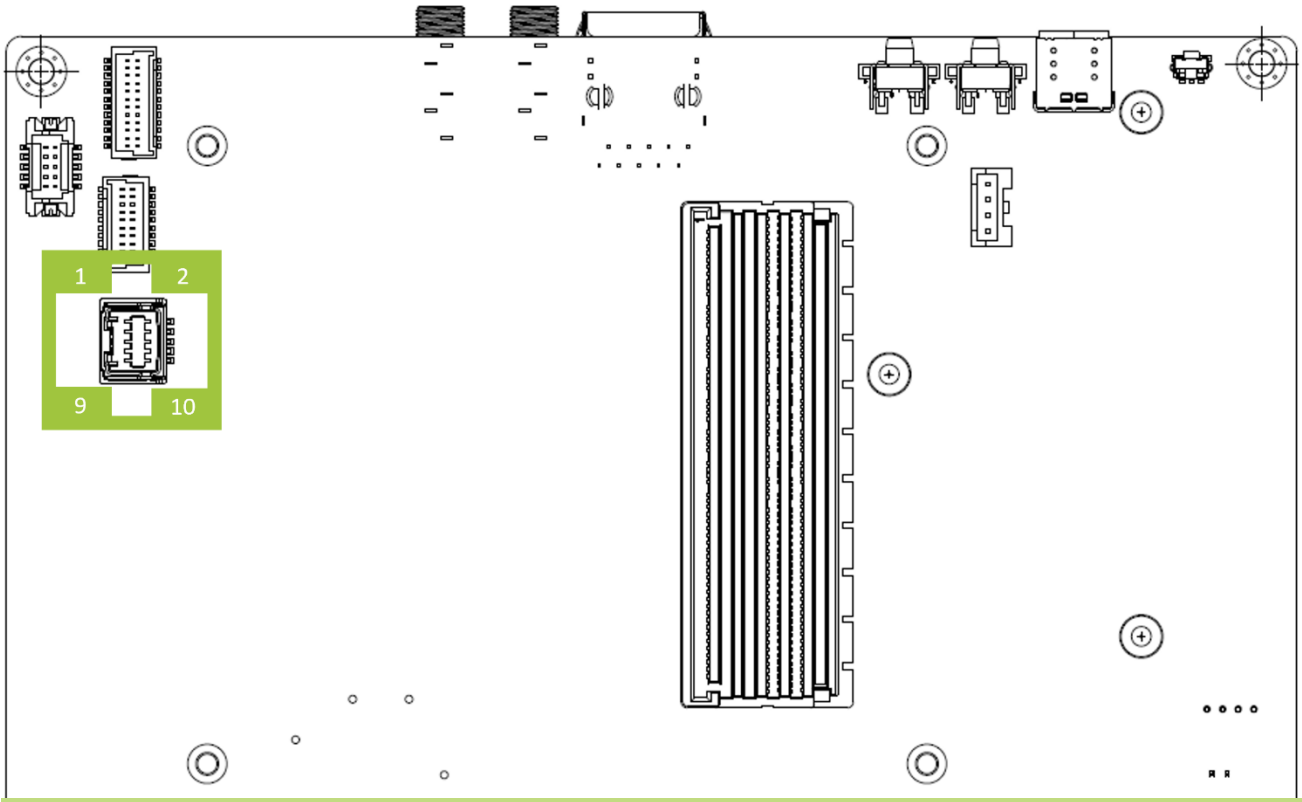
1PPS Module function



Property	Specification
Reference Designator	CN13
Connector	1x4 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	1PPS input supports 1.8V to 3.3V logic levels

Pin #	Signal	Pin Config
1	GND	PE.00 / Input / Pull-up
2	1PPS_CN	
3	NC	
4	VCC_1V8	

Front Panel Connector



Property	Specification
Reference Designator	CN19
Connector	2x5 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	Power Output: 12V / 5V / 3V3, up to 1.5A per rail All rails are independent and support simultaneous output

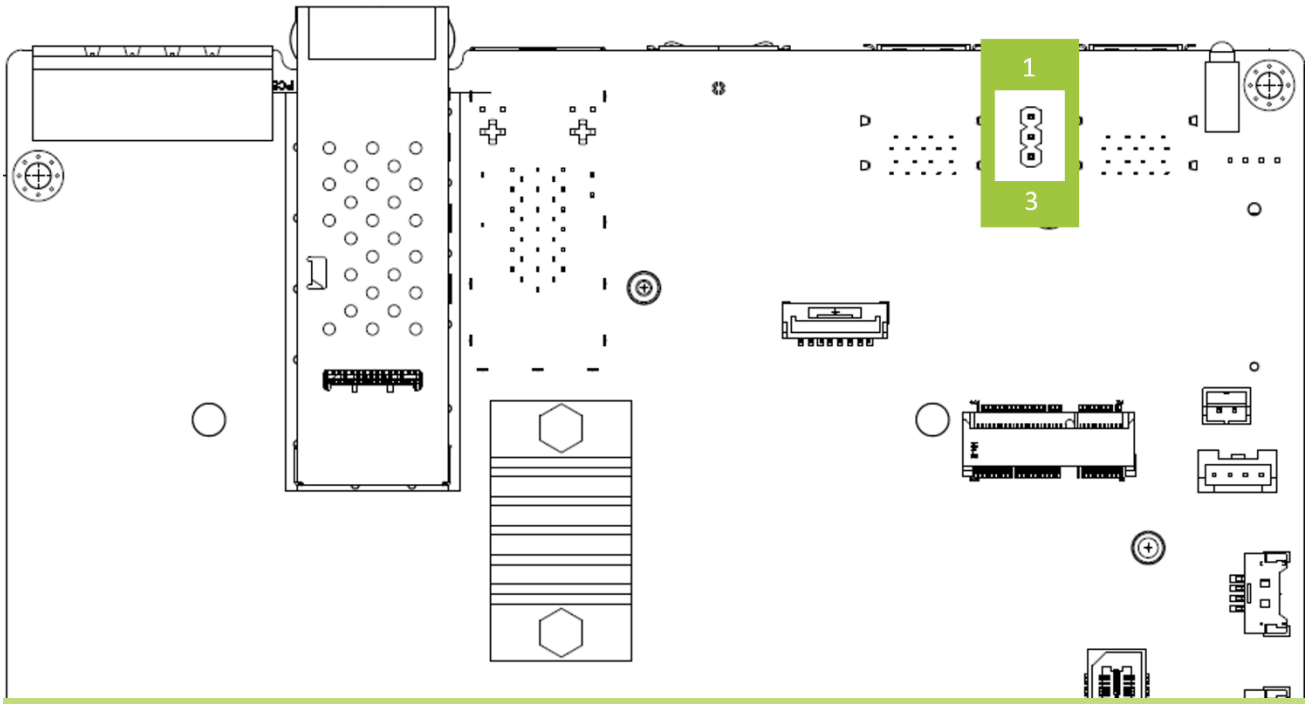
Pin #	Signal	Pin #	Signal
1	VCC_12V @ 1.5A Max*	2	GND
3	VCC_5V @ 1.5A Max	4	GND
5	VCC_3V3 @ 1.5A Max	6	GND
7	GND	8	PWRB_N
9	RECB_N	10	RSTB_N

* CN19 Pin 1 and CN7 Pin 2 share the same 12V rail.

The total combined current is limited to 2A.

Each connector has its own current limit (1.5A for CN19, 2A for CN7) based on connector specifications.

Debug UART

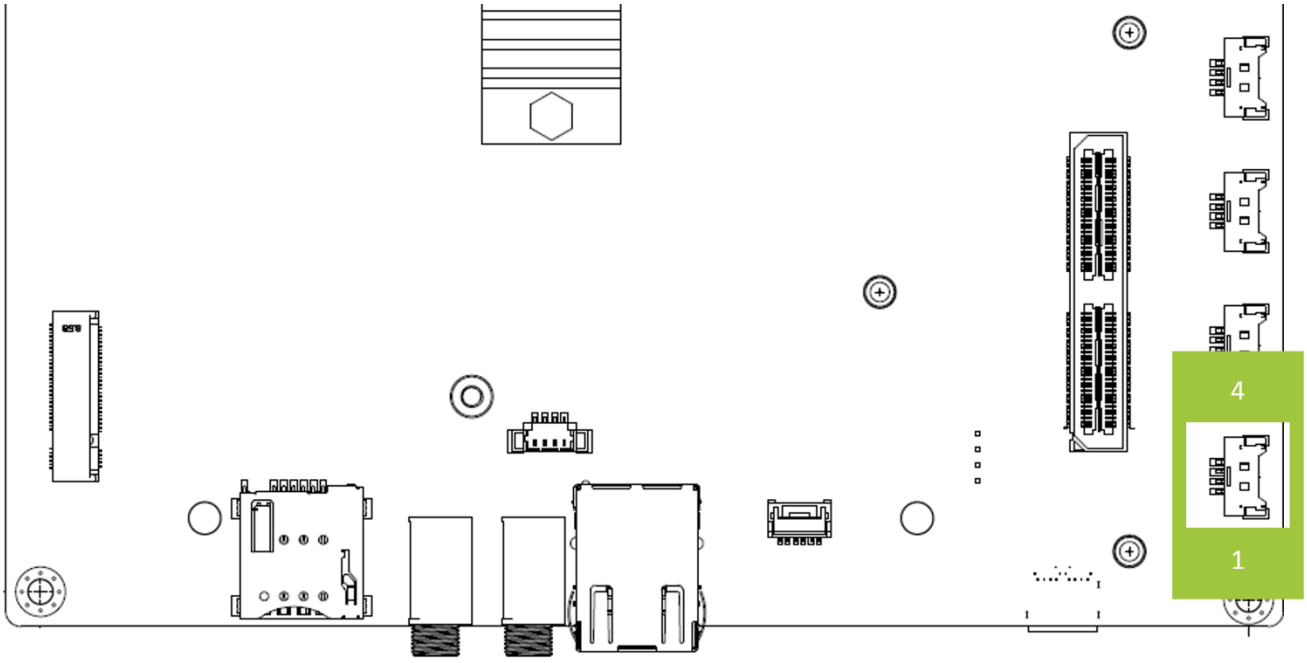


Property	Specification
Reference Designator	JP1
Connector	1x3 Pin, 2.54 mm Pitch (Board-to-Wire Header)

Pin #	Signal
1	DEBUG_TX (3V3 level)
2	DEBUG_RX (3V3 level)
3	GND

2.3.6. CAN

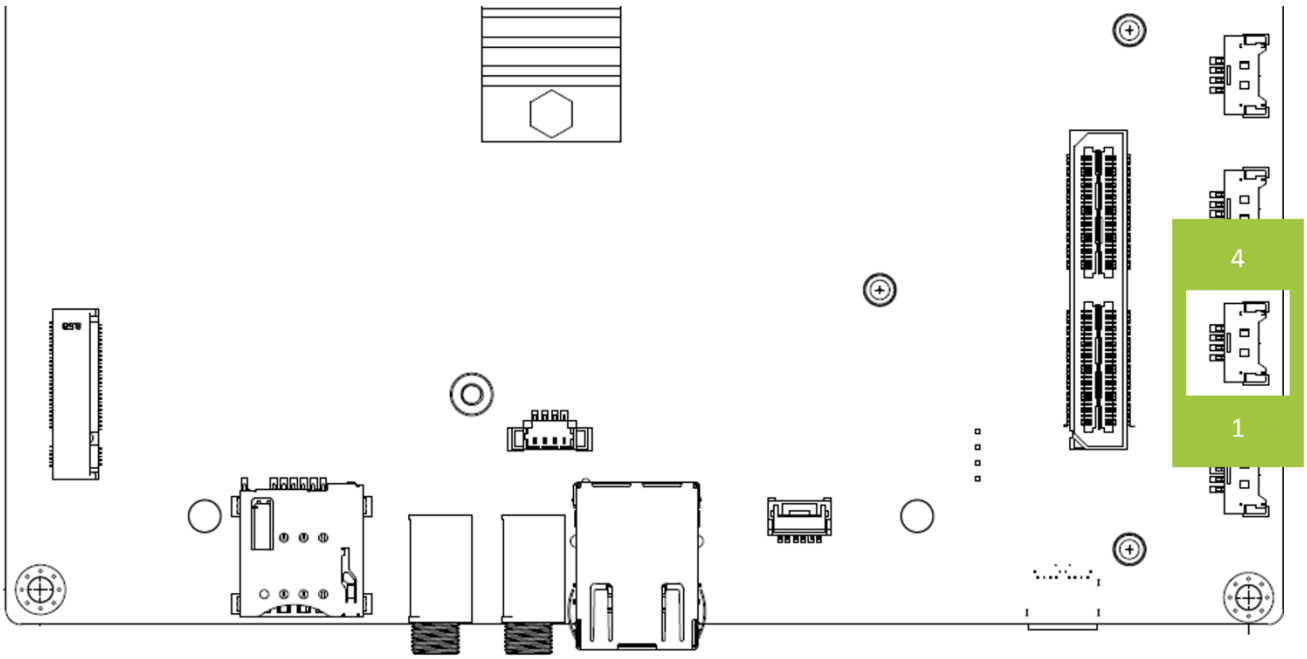
■ CAN BUS (CAN FD, isolated) Connector #1



Property	Specification
Reference Designator	CN21
Connector	1x4 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	The CAN interface is available on the Jetson T5000 module (AIB-AT78) only.

Pin #	Signal
1	GND_CAN1
2	CAN_1H
3	CAN_1L
4	GND_CAN1

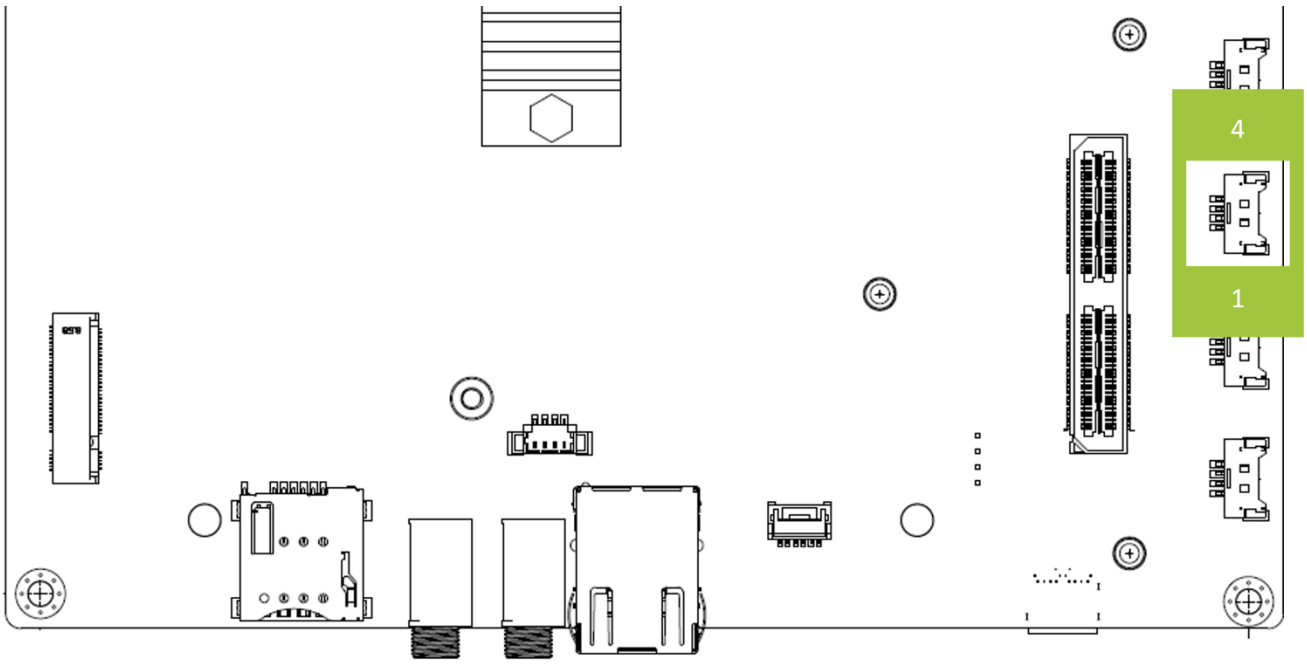
CAN BUS (CAN FD, isolated) Connector #2



Property	Specification
Reference Designator	CN22
Connector	1x4 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	The CAN interface is available on the Jetson T5000 module (AIB-AT78) only.

Pin #	Signal
1	GND_CAN2
2	CAN_2H
3	CAN_2L
4	GND_CAN2

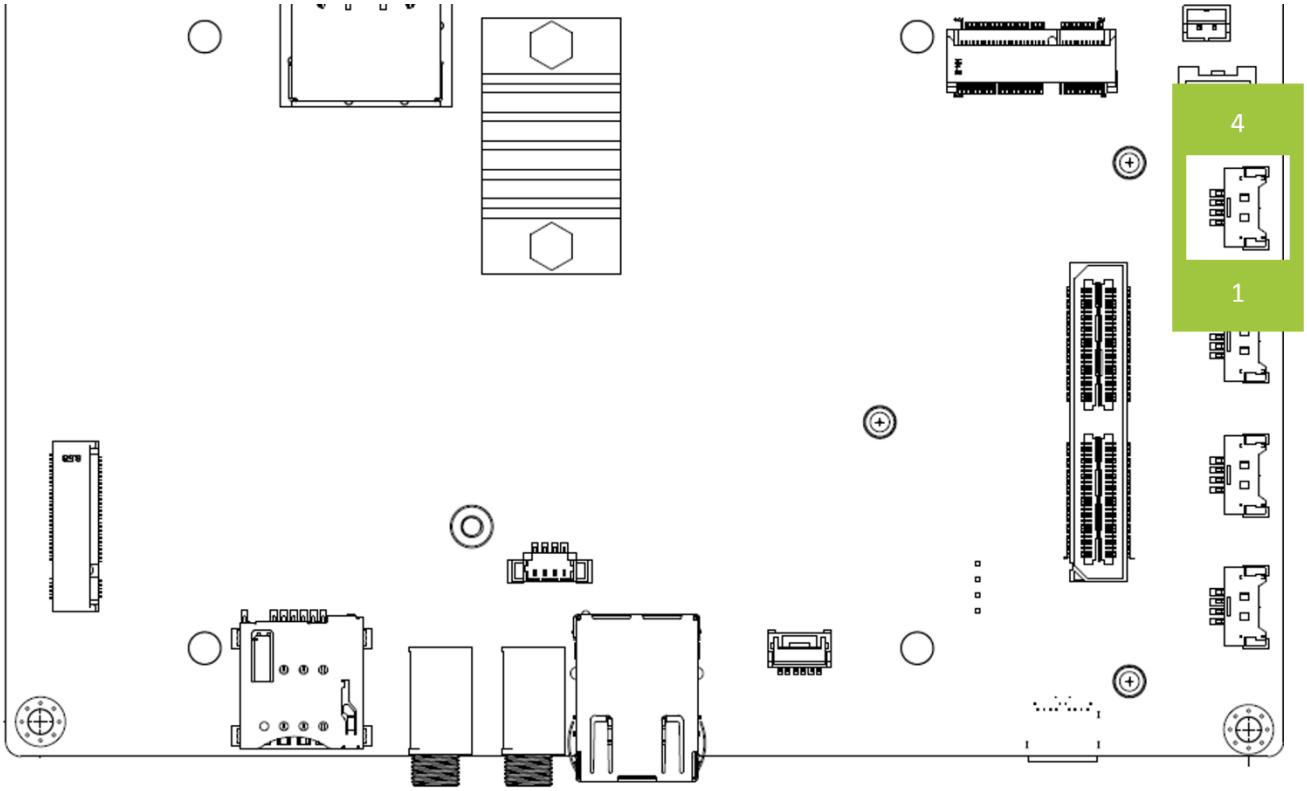
CAN BUS (CAN FD, isolated) Connector #3



Property	Specification
Reference Designator	CN23
Connector	1x4 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	The CAN interface is available on the Jetson T5000 module (AIB-AT78) only.

Pin #	Signal
1	GND_CAN3
2	CAN_3H
3	CAN_3L
4	GND_CAN3

CAN BUS (CAN FD, isolated) Connector #4

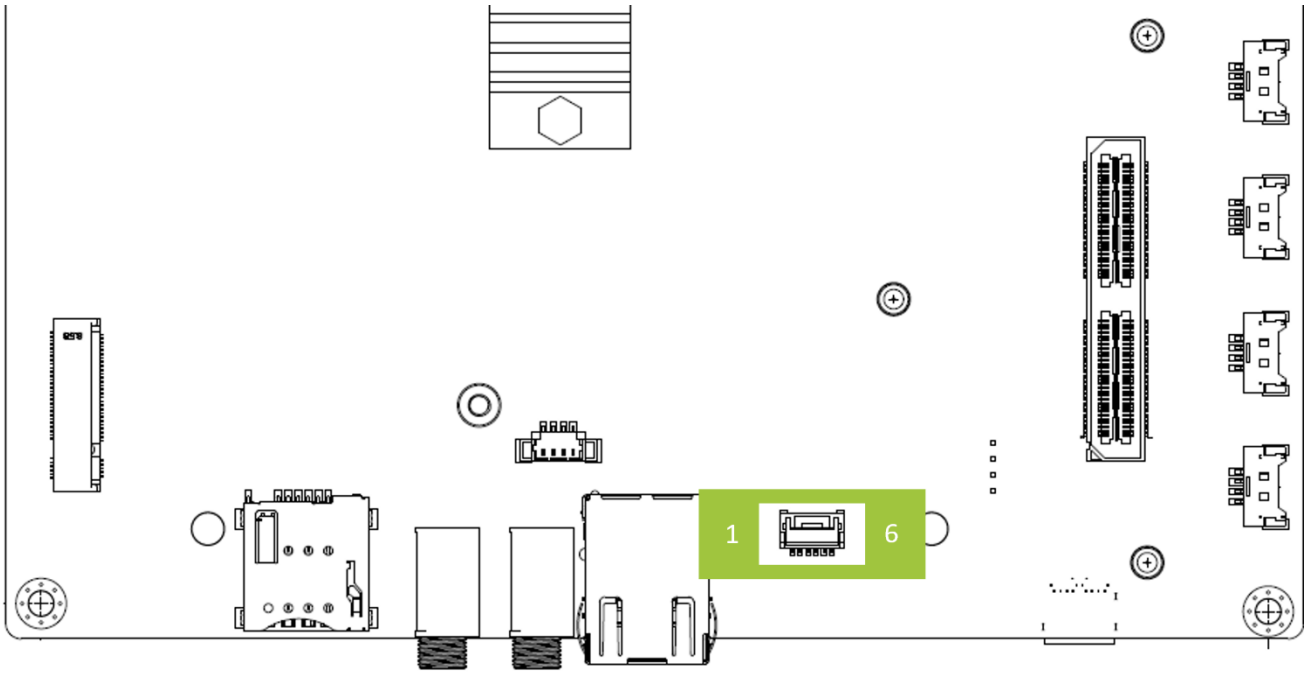


Property	Specification
Reference Designator	CN24
Connector	1x4 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	The CAN interface is available on the Jetson T5000 module (AIB-AT78) only.

Pin #	Signal
1	GND_CAN4
2	CAN_4H
3	CAN_4L
4	GND_CAN4

2.3.7. GMSL

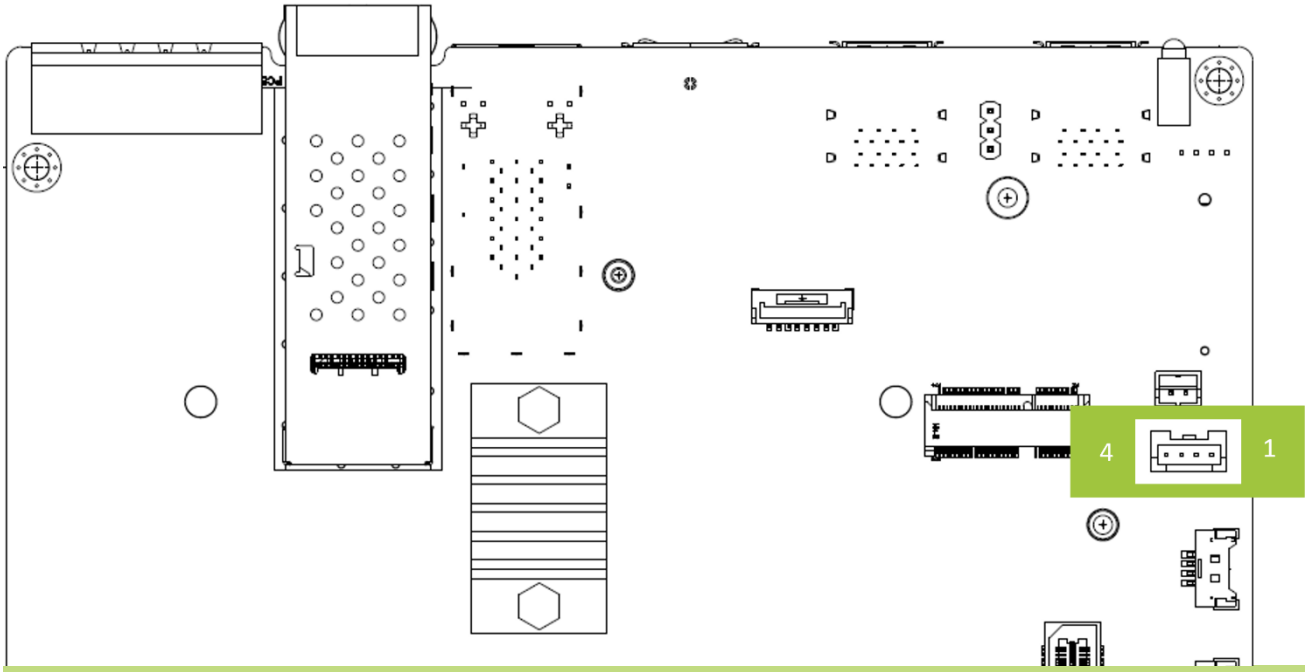
■ GMSL SYNC Connector



Property	Specification
Reference Designator	CN6
Connector	1x6 Pin, 1.0 mm Pitch Wafer (Board-to-Wire Header)

Pin #	Signal	Pin Config
1	VCC_1V8	
2	TRIG_PWM	PF.07
3	TRIG_D1	PY.02
4	TRIG_D2	PAA.00
5	TRIG_IO	PQ.04
6	GND	

GMSL Power Connector



Property	Specification
Reference Designator	CN7
Connector	1x4 Pin, 2.0 mm Pitch Wafer (Board-to-Wire Header)

Pin #	Signal
1	GND
2	VCC_12V @ 2A*
3	NC
4	NC

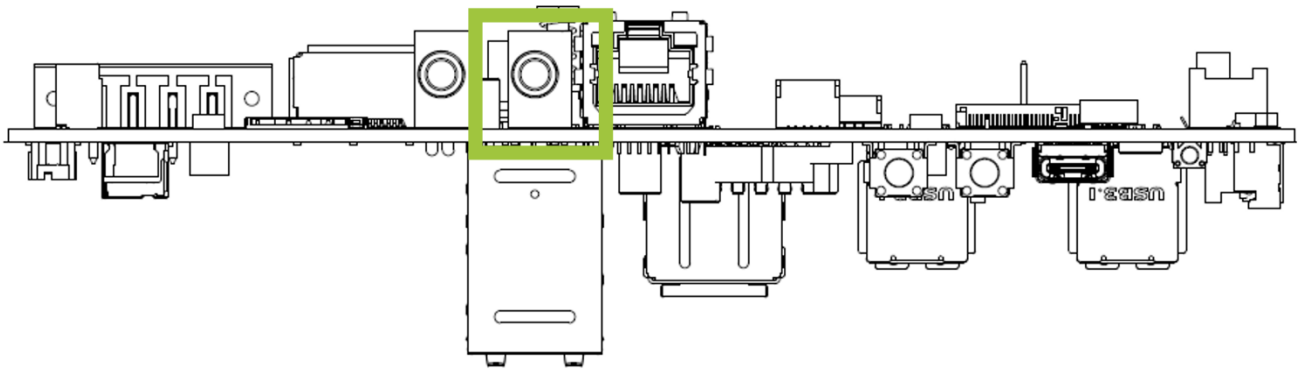
* CN7 Pin 2 and CN19 Pin 1 share the same 12V rail.

The total combined current is limited to 2A.

Each connector has its own current limit (2A for CN7, 1.5A for CN19) based on connector specifications.

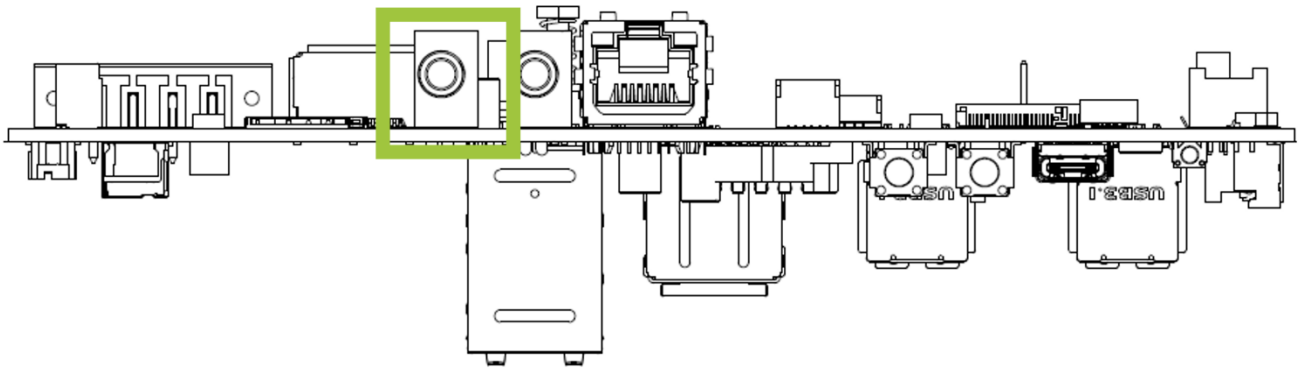
2.3.8. Audio

■ Line-in Jack



Property	Specification
Reference Designator	CN9
Connector	3.5mm TRS female jack

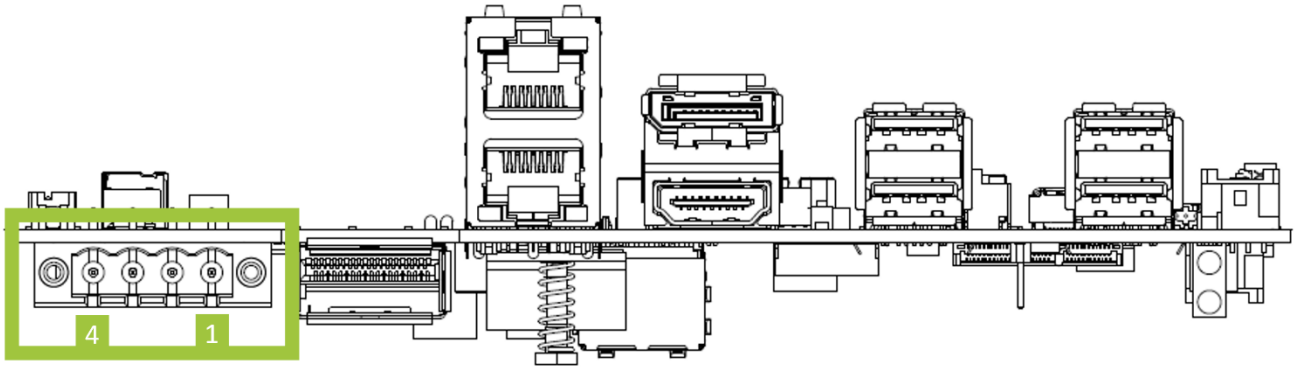
Headphone Jack



Property	Specification
Reference Designator	CN8
Connector	3.5mm TRS female jack

2.3.9. Power

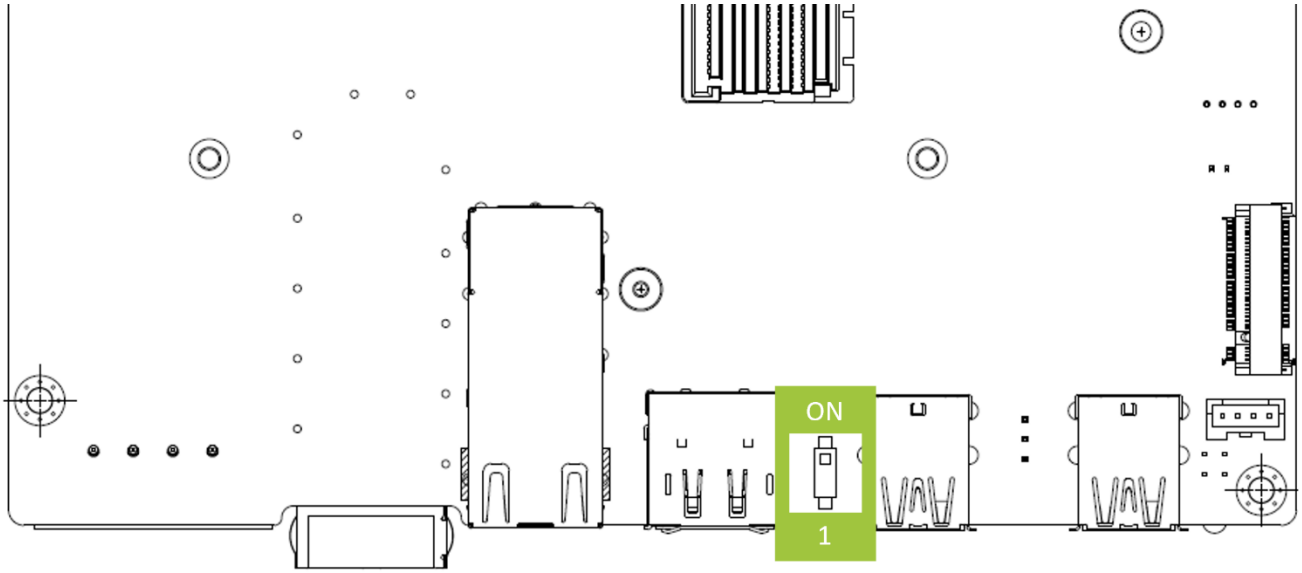
■ DC Power Input Connector



Property	Specification
Reference Designator	CN1
Connector	1x4-Contact, 5.08 mm pitch terminal block
Pinout	Please refer to terminal blocks standard

Pin #	Signal
1	−
2	+
3	+
4	−

Auto Power On (APO) Switch

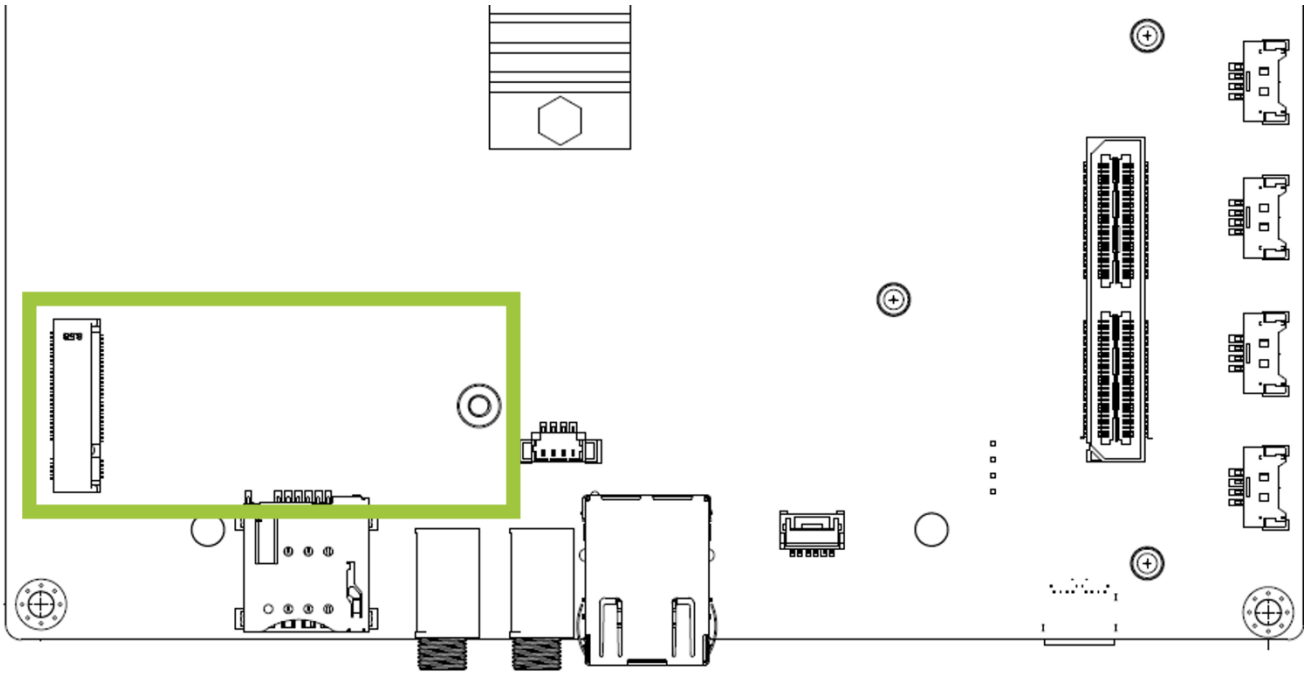


Property	Specification
Reference Designator	SW1
Connector	DIP Switch
Notes	This switch enables the APO function

Position	APO Function
ON (Default)	Enable
1	Disable

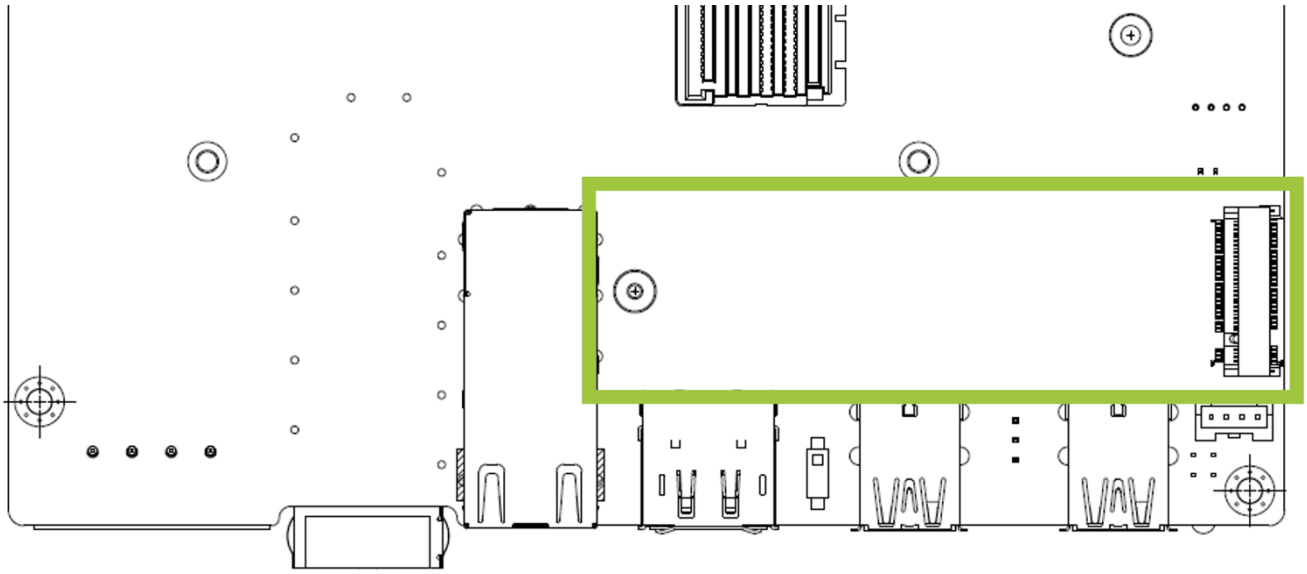
2.3.10. Internal Connector

■ M.2 B-Key 3052 Connector



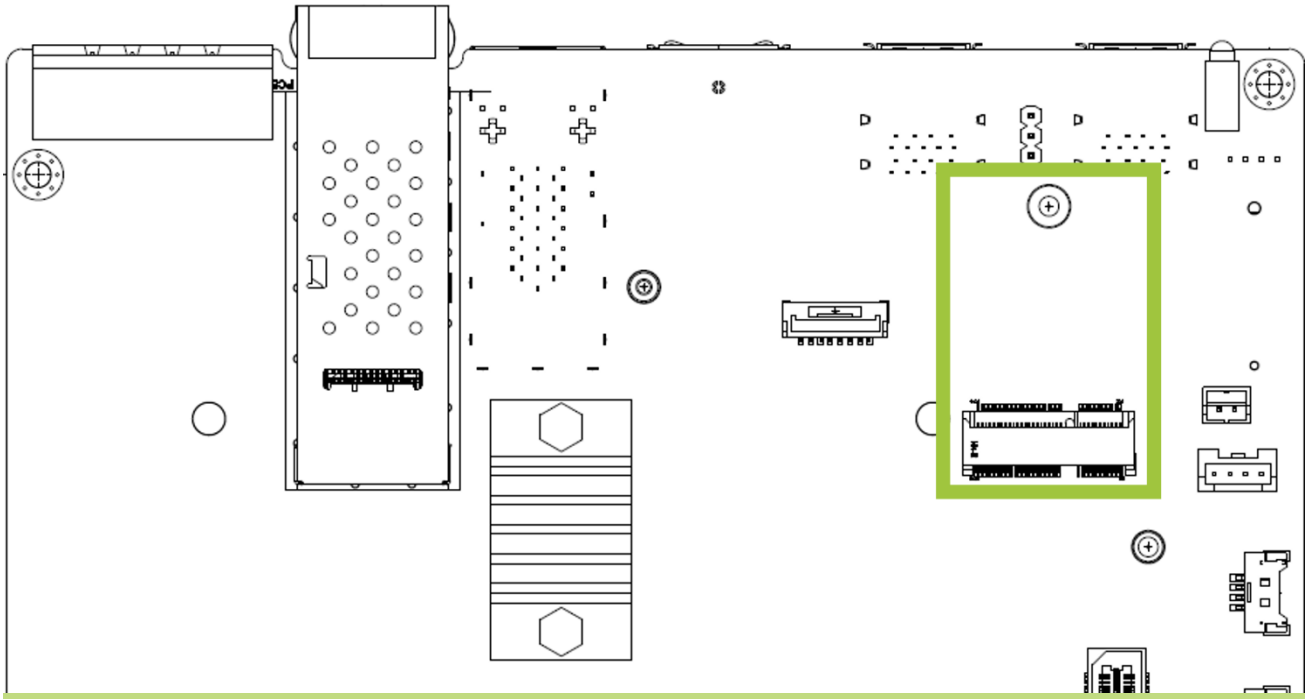
Property	Specification
Reference Designator	M2B1
Connector	M.2 B-Key 3052
Pinout	Pin definition follows the M.2 B-Key specification
Interface	USB 2.0 / USB 3.0
Notes	Supports LTE / 4G / 5G

M.2 M-Key 2280 Connector



Property	Specification
Reference Designator	M2M1
Connector	M.2 M-Key 2280
Pinout	Pin definition follows the M.2 M-Key specification
Interface	PCIe Gen5 x4
Notes	Supports NVMe, PCIe Gen5 x4

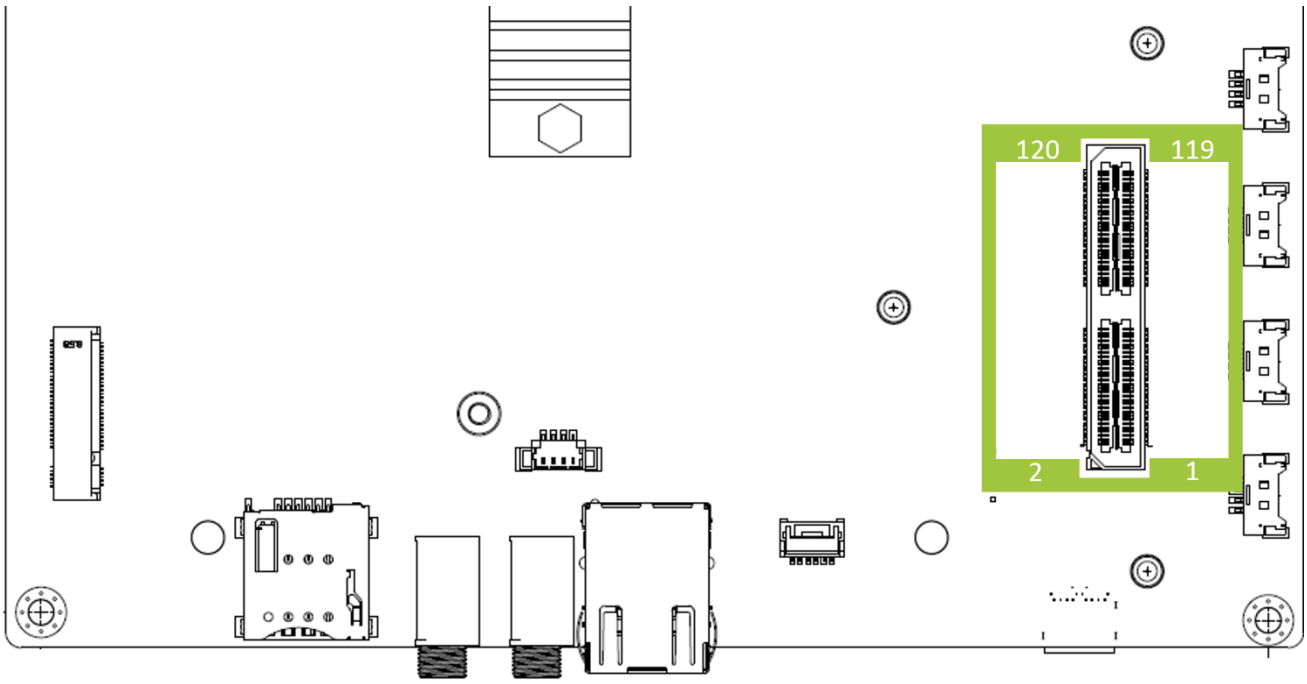
M.2 E-Key 2230 Connector



Property	Specification
Reference Designator	M2E1
Connector	M.2 E-Key 2230
Pinout	Please refer to M.2 E-Key standard
Interface	PCIe Gen5 x1 / USB 2.0
Notes	Supports Wi-Fi / Bluetooth

2.3.11. MIPI

■ 120-Pin Board-to-Board Connector for MIPI CSI-2



Property	Specification
Reference Designator	CN5
Connector	QSH 120-Pin connector

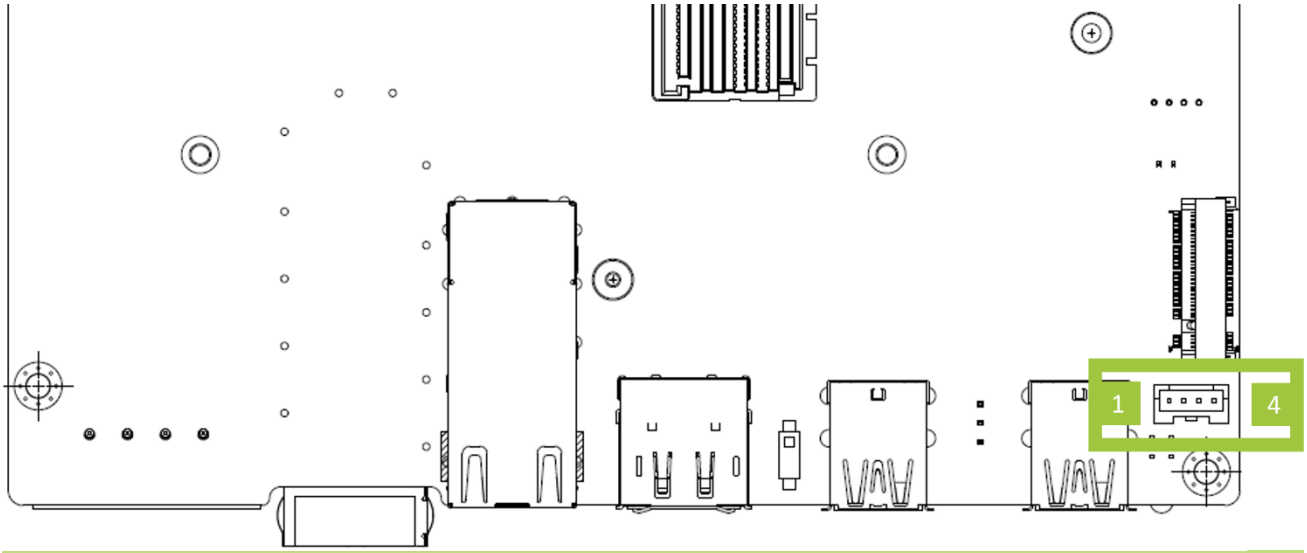
Pin #	Signal	Pin #	Signal
1	CSI0_D0_P	2	CSI1_D0_P
3	CSI0_D0_N	4	CSI1_D0_N
5	GND	6	GND
7	CSI0_CLK_P	8	CSI1_CLK_P
9	CSI0_CLK_N	10	CSI1_CLK_N
11	GND	12	GND
13	CSI0_D1_P	14	CSI1_D1_P
15	CSI0_D1_N	16	CSI1_D1_N
17	GND	18	GND

19	CSI2_D0_P	20	CSI3_D0_P
21	CSI2_D0_N	22	CSI3_D0_N
23	GND	24	GND
25	CSI2_CLK_P	26	CSI3_CLK_P
27	CSI2_CLK_N	28	CSI3_CLK_N
29	GND	30	GND
31	CSI2_D1_P	32	CSI3_D1_P
33	CSI2_D1_N	34	CSI3_D1_N
35	GND	36	GND
37	CSI4_D0_P	38	CSI6_D0_P
39	CSI4_D0_N	40	CSI6_D0_N
41	GND	42	GND
43	CSI4_CLK_P	44	CSI6_CLK_P
45	CSI4_CLK_N	46	CSI6_CLK_N
47	GND	48	GND
49	CSI4_D1_P	50	CSI6_D1_P
51	CSI4_D1_N	52	CSI6_D1_N
53	GND	54	GND
55	NC	56	NC
57	NC	58	NC
59	CSI5_D0_P	60	CSI7_D0_P
61	CSI5_D0_N	62	CSI7_D0_N
63	GND	64	GND
65	CSI5_CLK_P	66	CSI7_CLK_P
67	CSI5_CLK_N	68	CSI7_CLK_N
69	GND	70	GND
71	CSI5_D1_P	72	CSI7_D1_P
73	CSI5_D1_N	74	CSI7_D1_N

75	I2C3_CLK	76	MIPI_ERROR1
77	I2C3_DAT	78	MIPI_ERROR2
79	GND	80	GND
81	VCC_2V8	82	VCC_ 2V8
83	VCC_2V8	84	MIPI_ERROR3
85	MIPI_FRSYNC1_1V8	86	MIPI_ERROR4
87	I2C4_CLK	88	MIPI1_MCLK03
89	I2C4_DAT	90	MIPI1_ PWDN
91	MIPI0_MCLK02	92	MIPI1_RST
93	MIPI0_PWDN	94	MIPI2_MCLK04
95	MIPI0_RST	96	MIPI_FRSYNC4
97	MIPI_FRSYNC3_1V8	98	MIPI_FRSYNC2_1V8
99	GND	100	GND
101	NC	102	VCC_1V8
103	MIPI_INT3	104	MIPI_INT4
105	I2C5_CLK	106	MIPI_INT2
107	I2C5_DAT	108	VCC_3V3
109	NC	110	VCC_3V3
111	NC	112	NC
113	NC	114	NC
115	GND	116	GND
117	MIPI_INT1	118	VCC_3V3
119	MIPI_VDD_SYS_EN	120	VCC_3V3

2.3.12. FAN

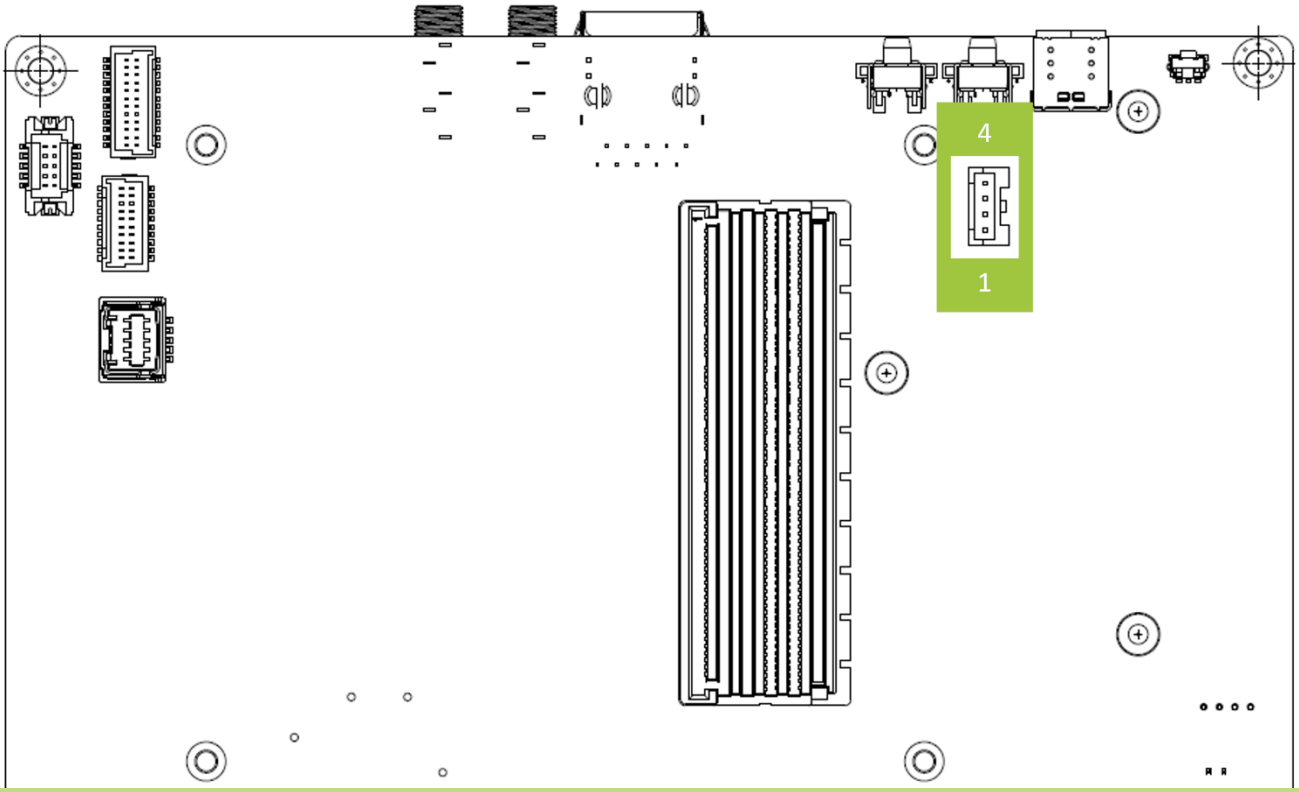
■ System Fan Connector



Property	Specification
Reference Designator	CN14
Connector	1x4 Pin, 2.0 mm Pitch Wafer (Board-to-Wire Header)

Pin #	Signal
1	GND
2	VCC_12V
3	SYS_FAN_TACH
4	SYS_FAN_PWM

Module Fan Connector

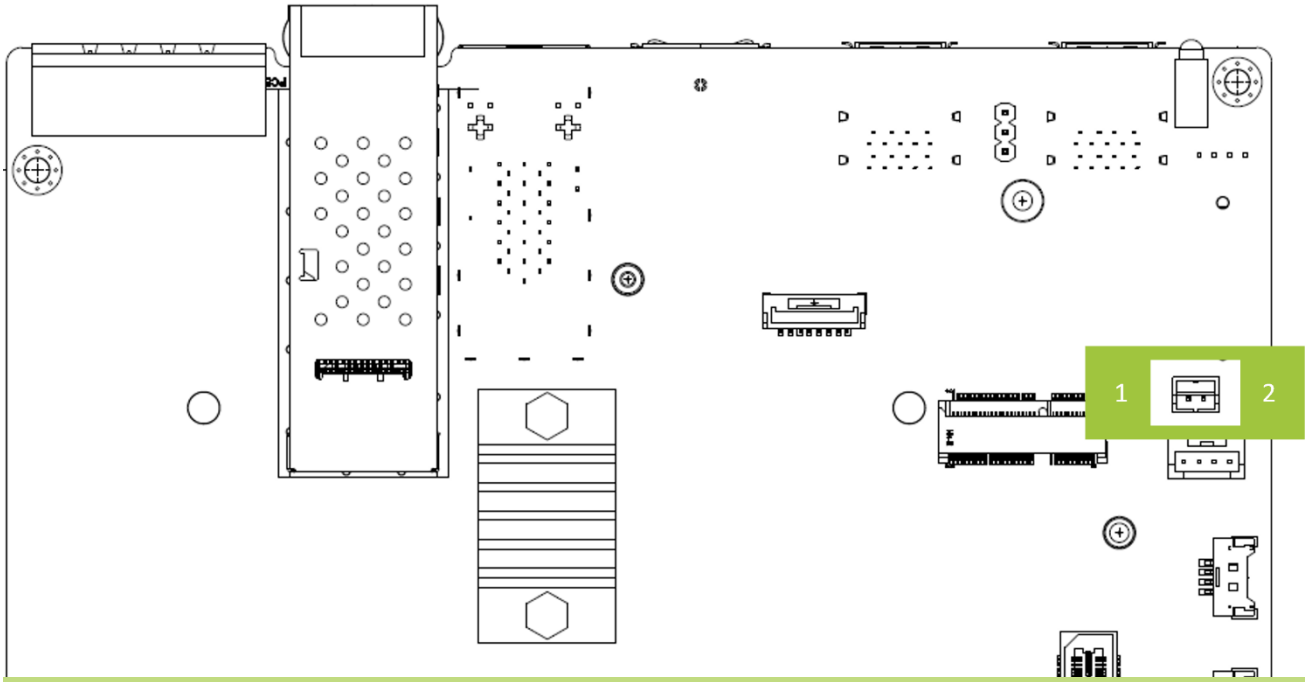


Property	Specification
Reference Designator	CN15
Connector	1x4 Pin, 2.0 mm Pitch Wafer (Board-to-Wire Header)

Pin #	Signal
1	GND
2	VCC_12V
3	SOM_FAN_TACH
4	SOM_FAN_PWM

2.3.13. RTC

■ RTC Battery Connector (Default with Battery)

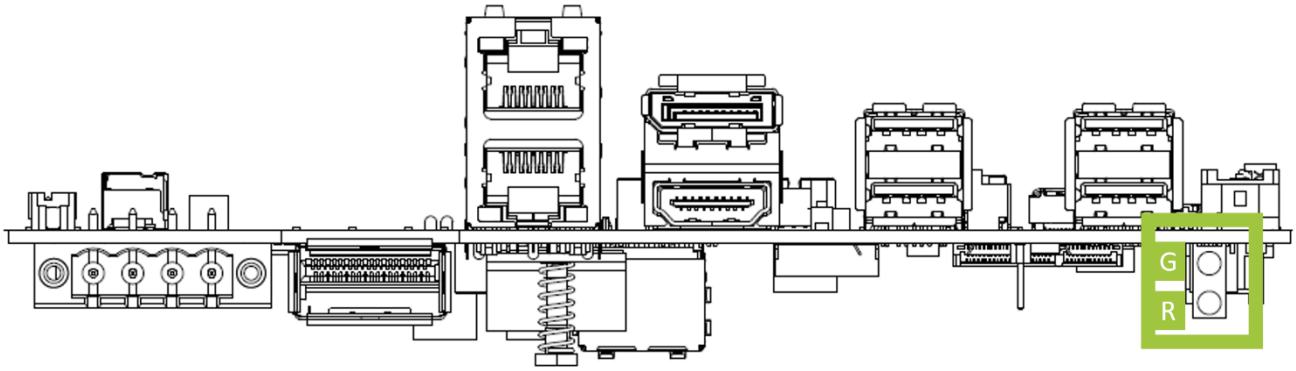


Property	Specification
Reference Designator	CN20
Connector	1x2 Pin, 2.0 mm Pitch Wafer (Board-to-Wire Header)

Pin #	Signal
1	+
2	—

2.3.14. LED

■ Power LED

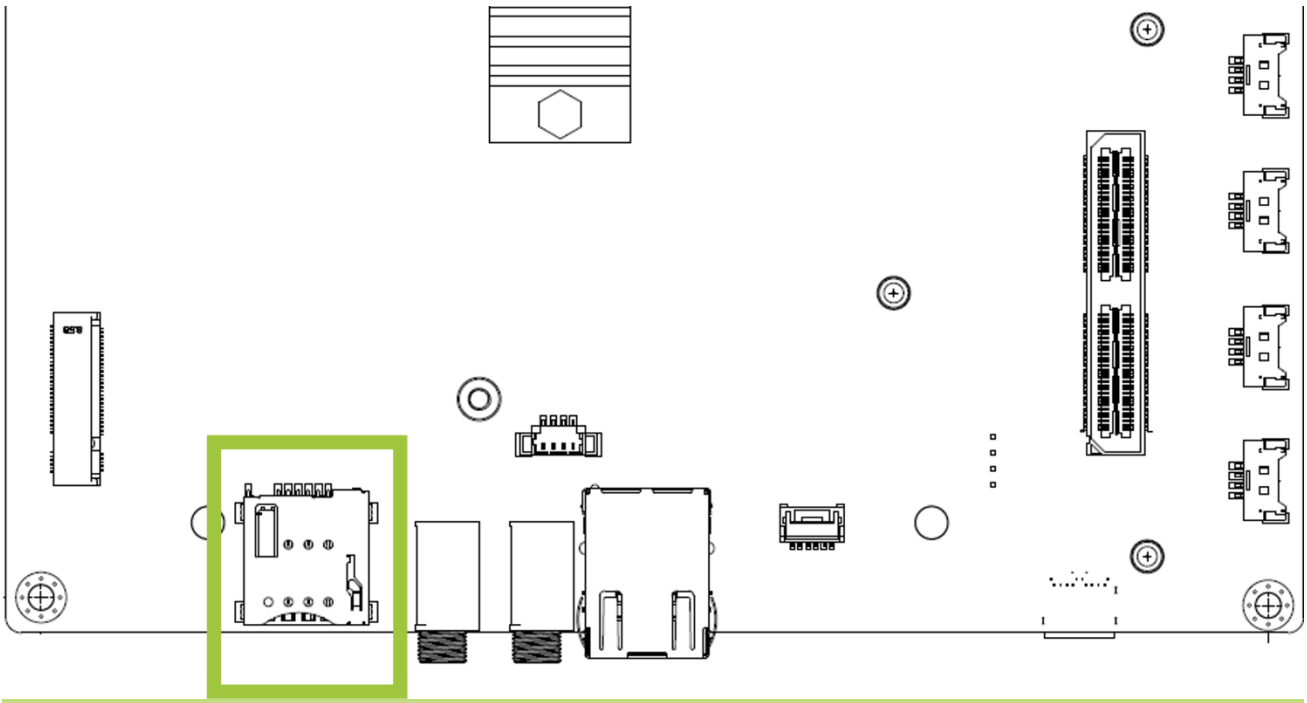


Property	Specification
Reference Designator	LED1
Connector	Dual-color indicator (Green / Red)

Indicator	Definition
G (Green)	System powered on (main power active)
R (Red)	Standby power detected
OFF	No power input detected

2.3.15. Socket

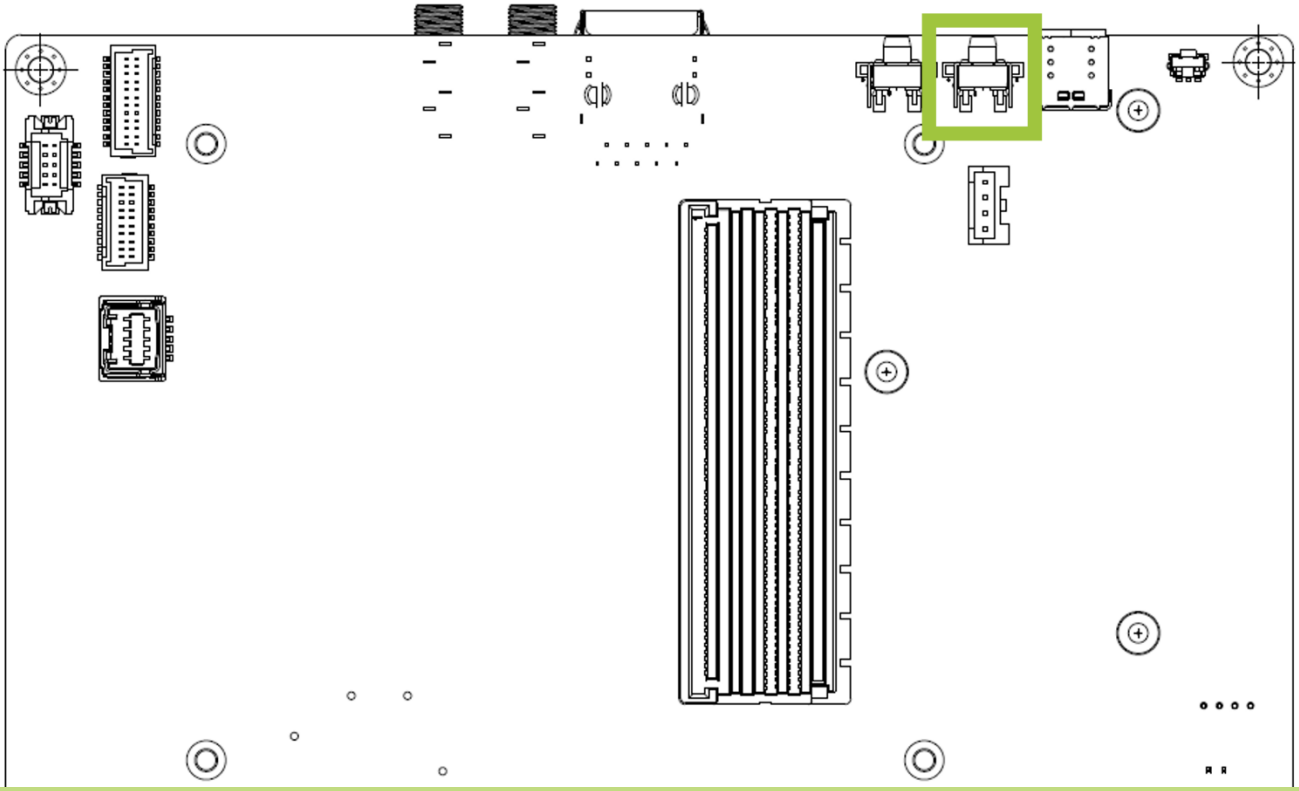
■ microSIM Card Socket



Property	Specification
Reference Designator	CN4
Connector	Push-Push SIM card

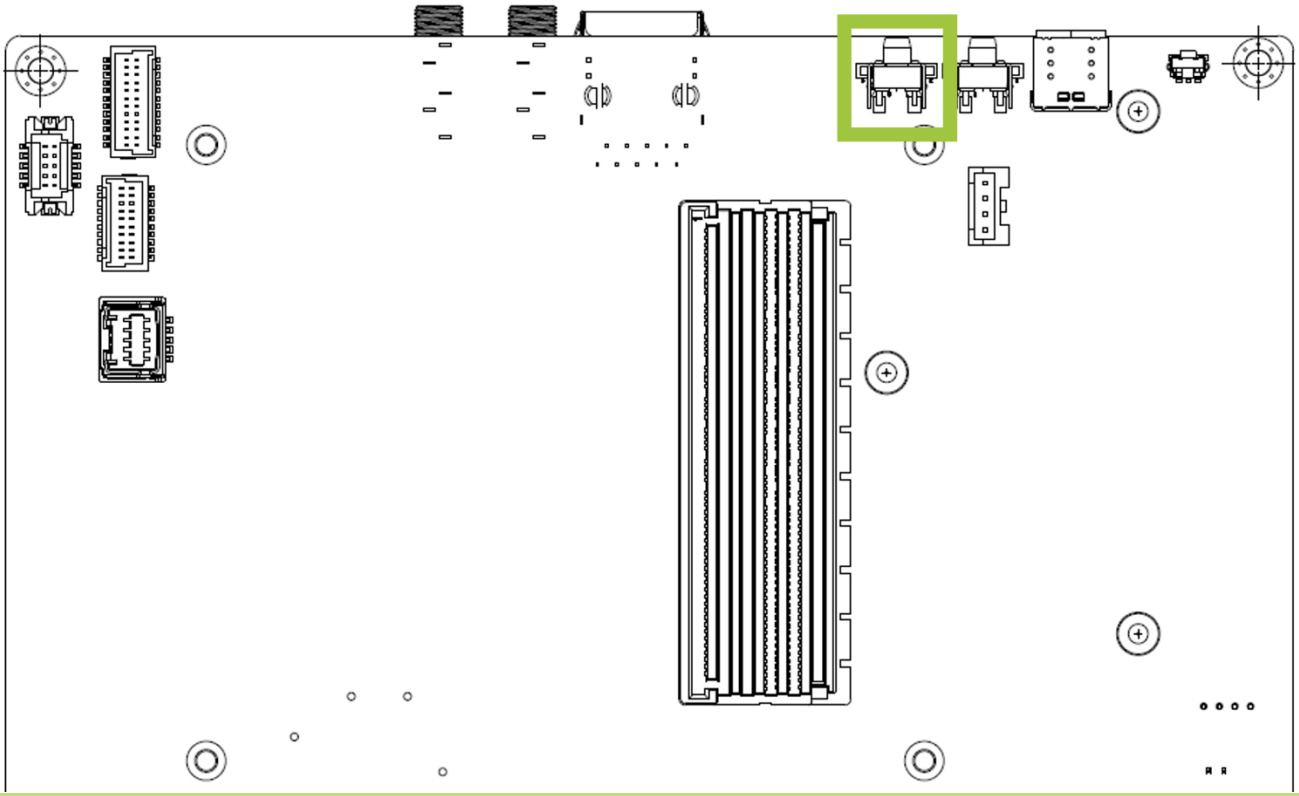
2.3.16. Button

■ Recovery Button



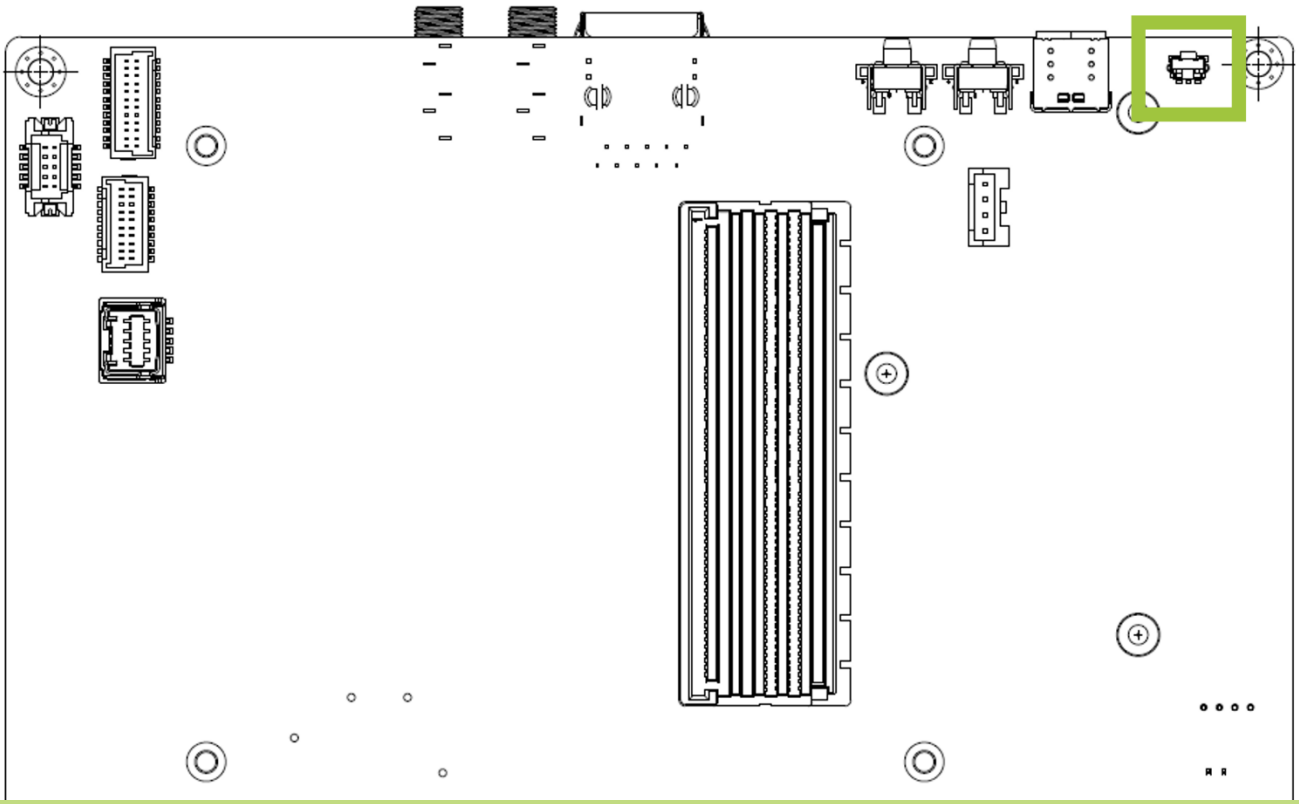
Property	Specification
Reference Designator	SW2
Connector	Tactile switch
Notes	To trigger system recovery action

Reset Button



Property	Specification
Reference Designator	SW3
Connector	Tactile switch
Notes	To trigger system reset action

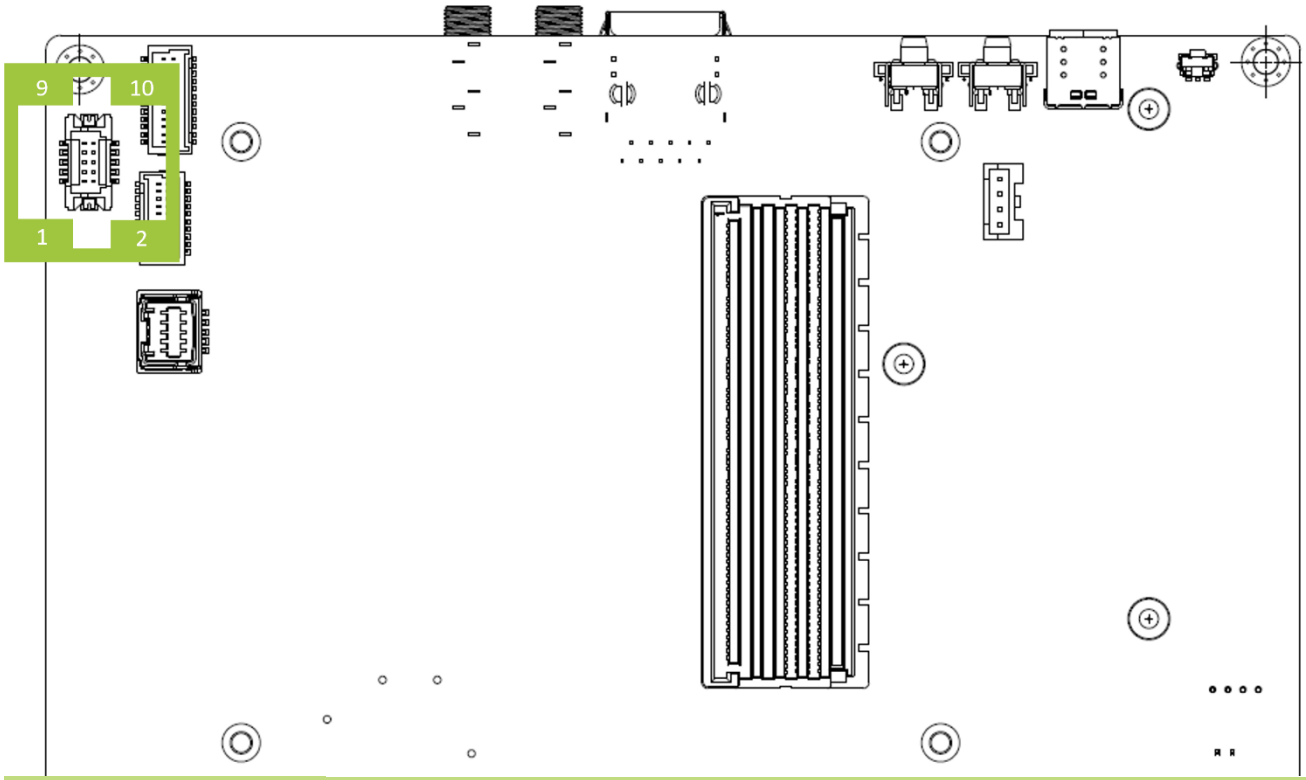
Power Button



Property	Specification
Reference Designator	SW4
Connector	Tactile switch
Notes	To trigger system power on/off

2.3.17. Optional

■ OOB Connector (Out-of-Band, Optional)



Property	Specification
Reference Designator	CN16
Connector	2x5 Pin, 1.25 mm Pitch Wafer (Board-to-Wire Header)
Notes	Optional; requires module support and software customization.

Pin #	Signal	Pin Config	Pin #	Signal	Pin Config
1	GND		2	VCC_5V (Standby)	
3	OOB_3V3_IO1	PP.04 / 3V3 / Input / No-pull	4	UART1_3V3_TX	
5	OOB_3V3_IO2	PP.03 / 3V3 / Input / No-pull	6	UART1_3V3_RX	
7	Power Button		8	OOB_IO3_CN	PP.05 / 3V3 / Input / No-pull

9	Reset Button		10	OOB_IO4_CN	PP.02 / 3V3 / Input / No-pull

2.4. Power Consumption

The power consumption shown as below is the theoretical value with Jetson Thor module installed on AIB-AT68 and AIB-AT78:

Model Name	Condition	Power Consumption (W)
AIB-AT78	Idle	33 W
	Full Loading	170.11 W (12V)
AIB-AT68	Idle	30 W
	Full Loading	114.48 W (12V)

*Idle: Connect with Keyboard, Mouse, HDMI Display.

Full Loading: Connect with Keyboard, Mouse, HDMI Display with CPU and GPU 100% Loading.

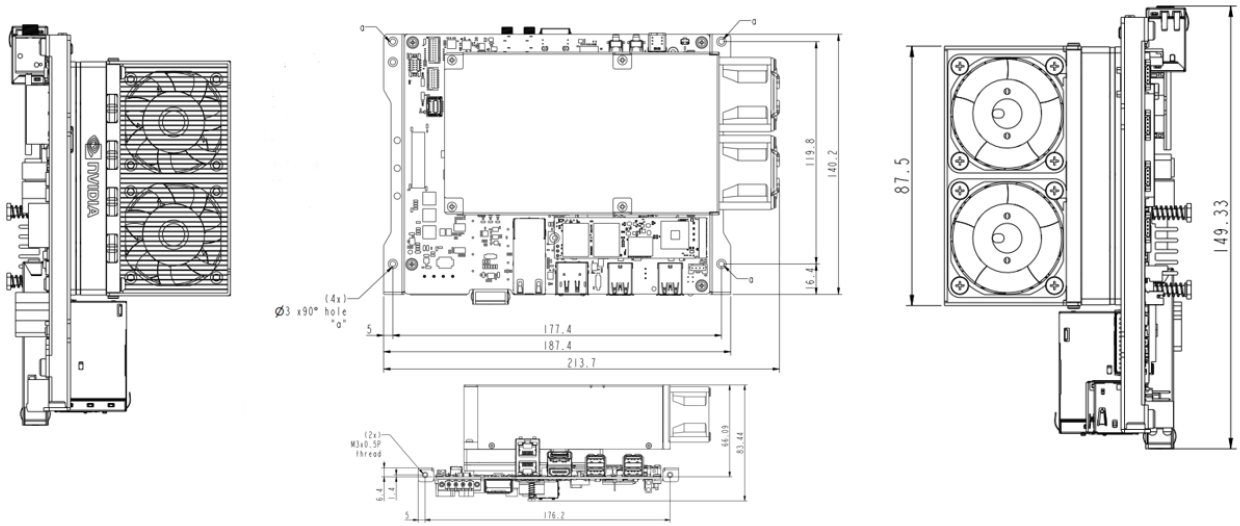
Please refer to the following power consumption of individual I/O interface according to your use case.

Interface	Theoretical Max Power (W)
USB 3.2 Gen2 Type A (per port)	5V*1.5A/7.5W (per port)
USB Type C	NA or 5V*3A/15W
HDMI	5V*0.3A/1.5W
DP	3.3V*0.5A/1.65W
M.2 E-KEY	3.3V*2A/6.6W
M.2 M-KEY	3.3V*3.5A/11.55W
M.2 B-KEY	3.3V*2.5A/8.25W
RJ45(10G)	3.3V*1.5A/4.95W
QSFP28	3.3V*1.5A/4.95W

2.5. Mechanical Dimensions

Integration assembly drawing for AIB-AT78/AT68 carrier board, Jetson Thor T5000/T4000 modules and Fansink.

AIB-AT78/AT68 System & Mounting Dimensions



3. Software/BSP Installation

Aetina NVIDIA Jetson products have built-in BSP so the users don’t have to install it after getting the products. Since we develop our own BSP, the users may need to follow the BSP installation SOP to re-install/upgrade/downgrade the BSP. Please visit the Aetina website or contact with Aetina FAE at Tech_support@aetina.com for installation guides, BSPs and technical tips.

4. Recovery Mode

The OTG Type-C port of AIB-AT78/AT68 can be connected to another host device (Linux PC running NVIDIA Jetpack™) to run recovery process for re-flashing BSP.
Note: Please backup user personal files before flashing process

Connect the OTG Type-C port to another host device which supplying updated BSP file.
Press and hold the Reset button, then press and hold the Recovery button continually.
After one second (1 sec.) release the Reset button first, then release the Recovery button.
The Jetson Thor will show up as a new NVIDIA device on USB list (Terminal console) at the host device.
Running re-flashing BSP process can be executed by the host device now.

5. Initial Setup

Before using AIB-AT78/AT68 series, please follow the steps below to have initial setup.

5.1. Prepare the materials

Please prepare the materials list below.

- A monitor with HDMI and respective cables
- USB keyboard and mouse
- Ethernet cable

5.2. Hardware connection

ATTENTION: Jetson Thor module is not hot-pluggable. Before installing or removing the module, the main power supply (to power connector, CN1) must be disconnected and adequate time allowed for the various power rails to fully discharge.

For the initial setup, users will need to connect LAN port, keyboard and mouse via USB interface, HDMI interface, and power connector.

5.3. Setup details

Step 1: Connect to the monitor while powering off

Step 2: Power on and automatically enter the OS

Step 3: Log in to the Ubuntu OS via credentials below

- Username: nvidia
- Password: nvidia

For more information on how to use Ubuntu and NVIDIA Jetson modules, please visit Ubuntu and NVIDIA website.

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