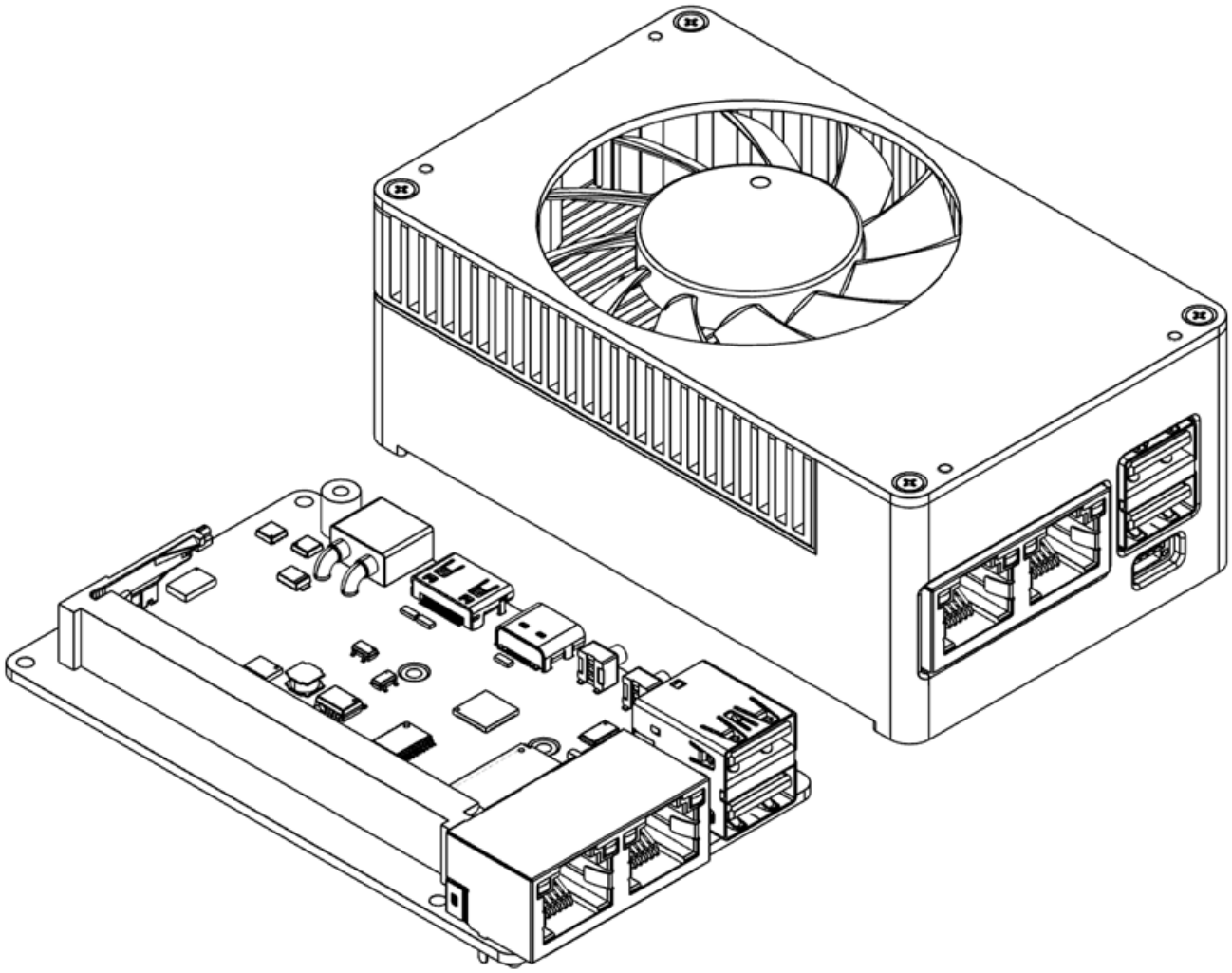
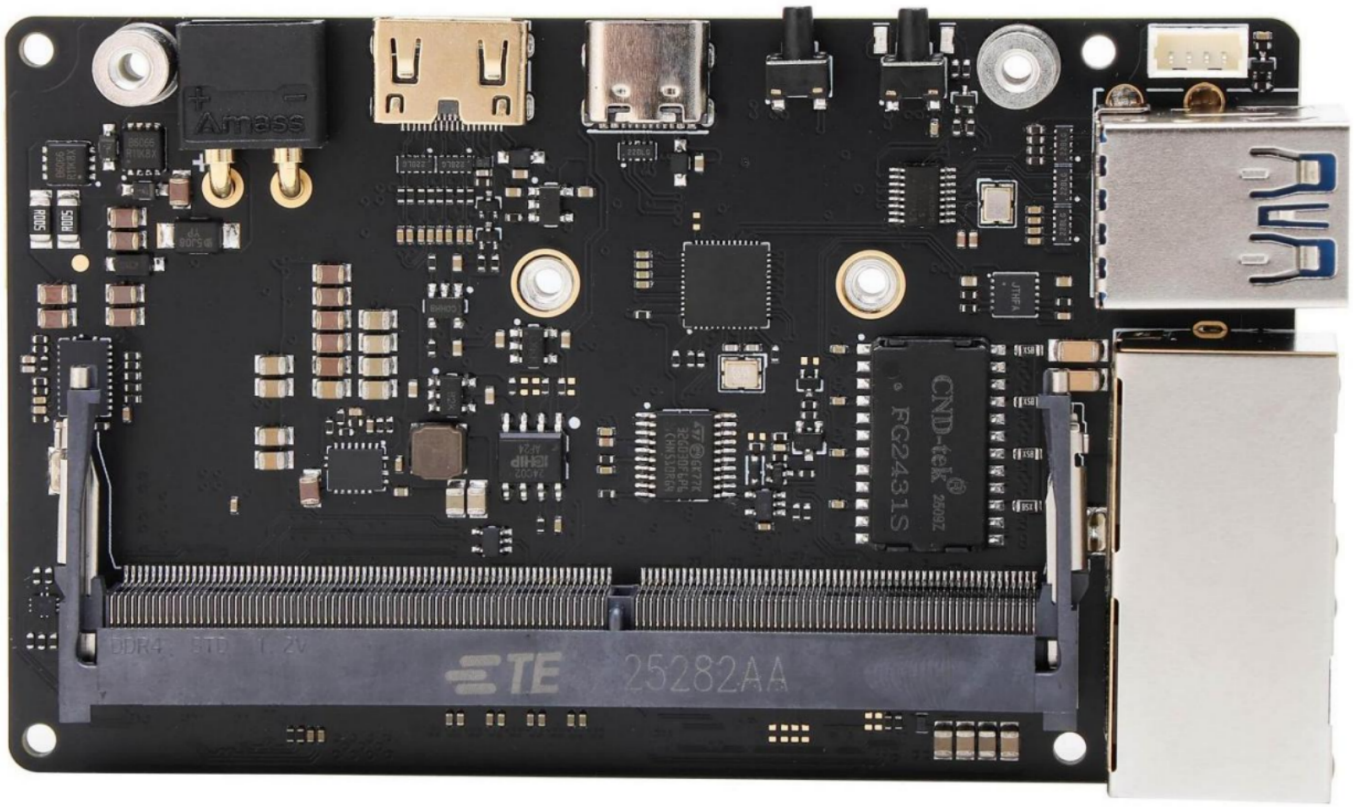
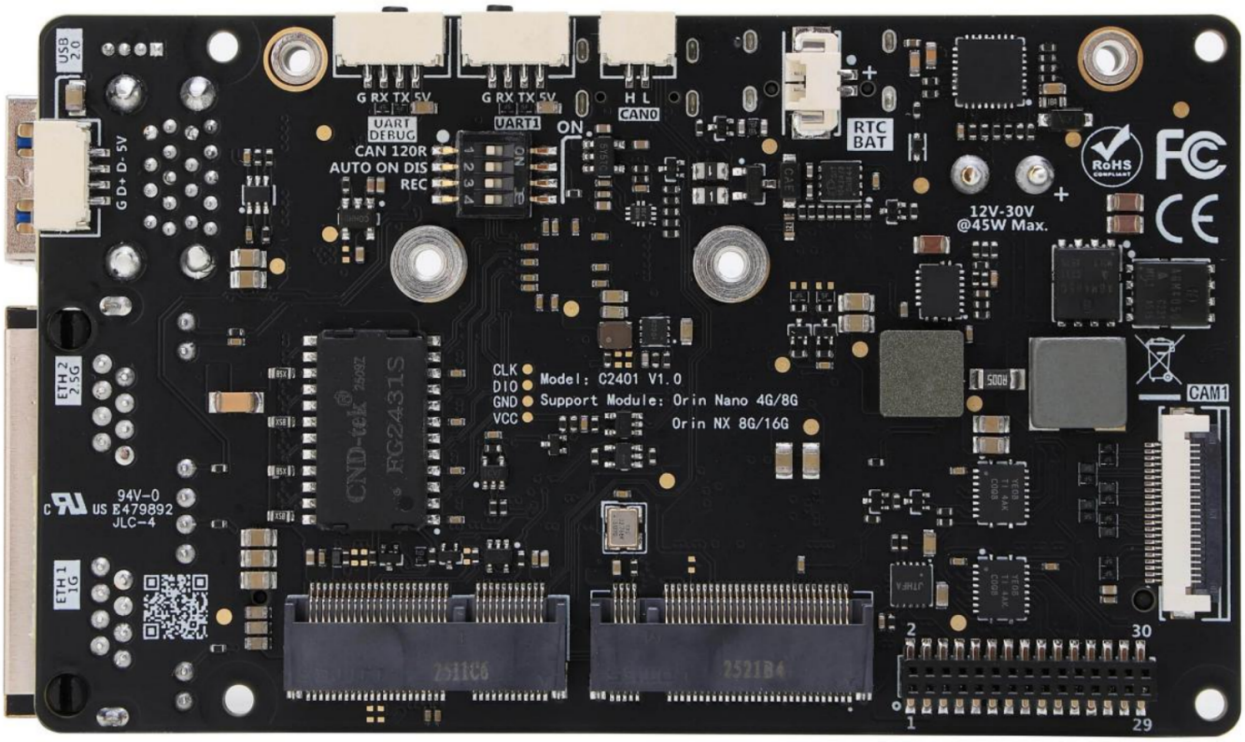
C2401 Inroduction



Introduction

The **C2401** is a compact, high-density carrier board designed for **NVIDIA Jetson Orin Nano/NX** modules. It boasts comprehensive connectivity options, including dual Ethernet ports, dual USB ports, and expansion support for 4G/5G modules. Its space-saving stacked design ensures excellent ease of integration.


Amass
CND-tek
FG2431S
TE
25282AA


USB 2.0
G RX TX 5V
G RX TX 5V
H L
UART DEBUG
UART1
CAN0
ON
CAN 120R
AUTO ON DIS
REC
RTC BAT
12V-30V
@45W Max.
RoHS
FC
CE
CLK
DIO
GND
VCC
Model: C2401 V1.0
Support Module: Orin Nano 4G/8G
Orin NX 8G/16G
CND-tek
FG2431S
CAM1
ETH2 2.5G
ETH1 1G
94V-0
US E479892
JLC-4
2
30
1
29

Features

- Equipped with an advanced automotive-grade E-fuse chip, providing comprehensive protection against over-voltage, under-voltage, short-circuit, over-current, and reverse polarity.
- Utilizes an ultra-low-resistance Buck chip, matched with an advanced alloy flat-wire inductor, featuring low heat generation and high saturation current characteristics to ensure stable power supply to the module.
- Features an 8-layer, 2u gold-plated, via-in-pad (VIP) process PCB, combined with a compact, high-density design, resulting in an external dimension of only 55x92mm.
- Rich peripheral interfaces, including dual USB 3.0 ports and dual network ports (Ethernet). One of the 2.5G ports supports the PTP (Precision Time Protocol) and high-density jumbo frames up to 16K bytes.
- The M.2 interface is designed on the same side for excellent accessibility and practicality. This allows for the replacement of the Wi-Fi card or solid-state drive (SSD) without needing to dismantle the module. It also includes a secondary development interface for expansion, such as 4G/5G network adapter.

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Supply Voltage	12V (compatible with 9.5V-30V)
Power Connector	XT30 interface
Supported Module	Orin Nano 4G/8G Orin NX 8G/16G
Ethernet	1x Gigabit Ethernet Socket (RJ45) , supports 9KB jumbo frames 1x 2.5G Ethernet Socket (RJ45) , supports 16KB jumbo frames and PTP protocol
Wireless Network	1x M.2 Key E?2230?
External Storage	1x M.2 Key M (2230 NVME SSD)
DisplayPort	1x Mini HDMI V2.1
USB	2x USB3.2 (10Gbps) 1xUSB2.0(GH1.25-4p)
USB-C	1x Type C (USB 2.0) for firmware flashing
Camera	1x CSI-22P
Other	UART, CAN, I2C
RTC	1x RTC backup clock battery interface
Operating Temperature	0?~45?

- The carrier board requires a 12V(compatible with 9.5-30V) DC power supply. To ensure normal system operation, a power adapter with sufficient current output must be used. Additionally, under high load conditions with an input voltage exceeding 15V, adequate heat dissipation must be provided to prevent overheating.

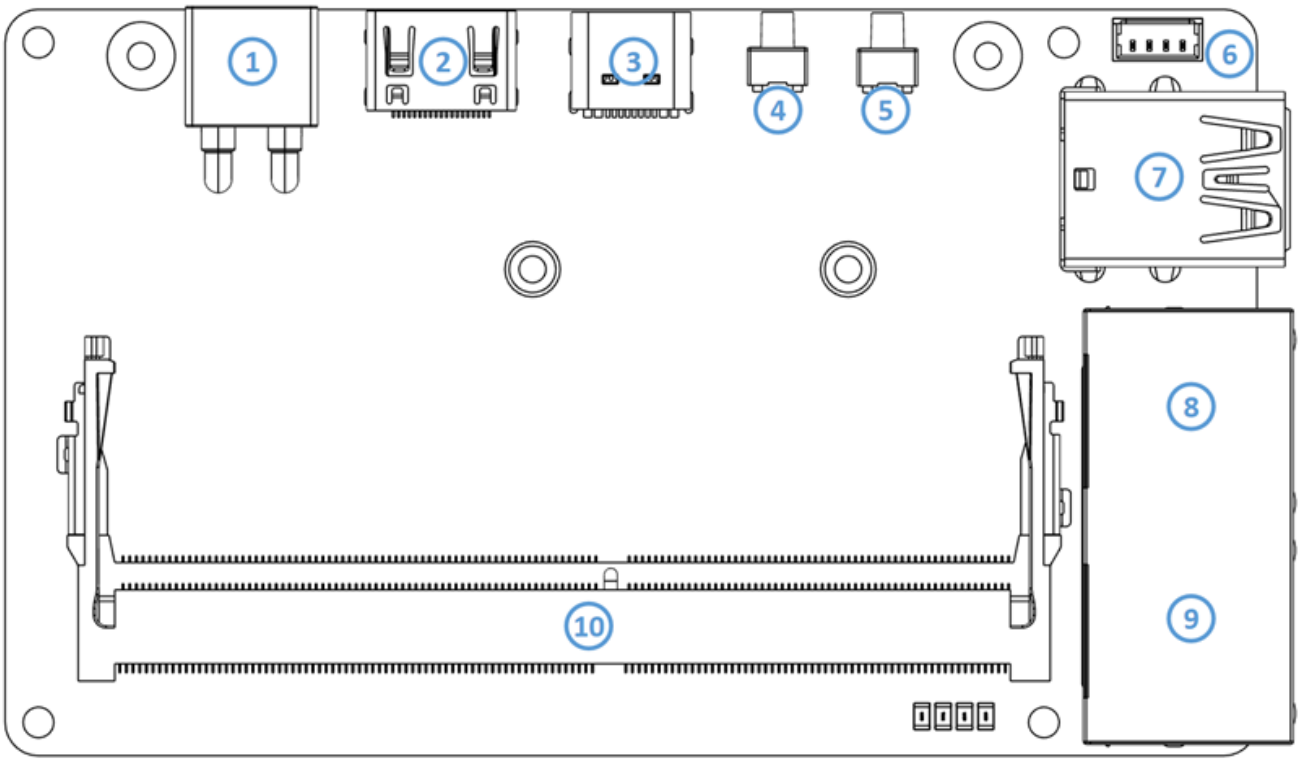
- This product includes reverse-polarity protection. Nevertheless, do not connect the power supply in reverse.

- The overcurrent protection (OCP) threshold for all USB ports is 2.5A. Exceeding this limit will trigger an automatic power-off.

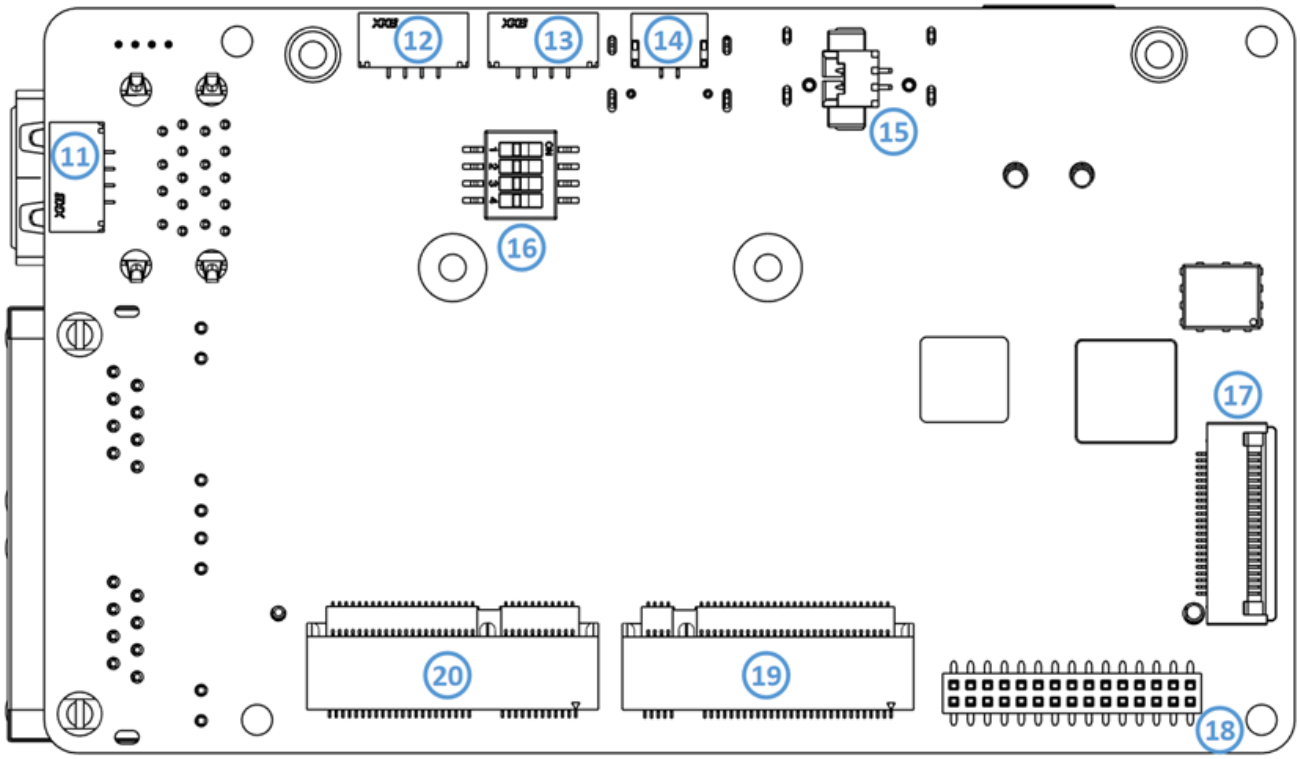
- In contrast to the original M.2 2230 interface, the backplane's network interface now features a symmetrical layout.

Do not hot-swap the module. Always power off the board before inserting or removing the module. Failure to do so may damage the module and the carrier board. Damage caused by improper operation is not covered under warranty.

Interface Layout



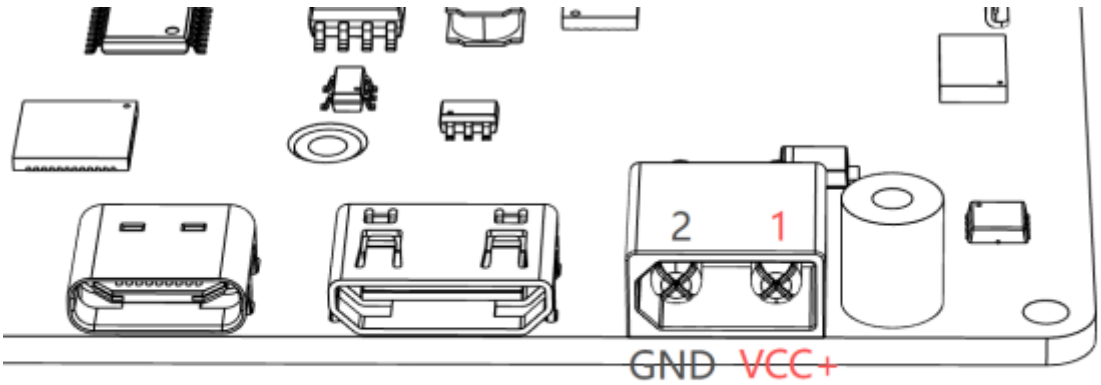
□□	□□	□□	□□
1	XT30 Power Jack	**11**	USB2.0 Connector (GH1.25 4p)
2	Mini HDMI	**12**	UART2 Connector (GH1.25 4p)
3	USB Type C (USB2.0)	**13**	UART1 Connector (GH1.25 4p)
4	REC Button	**14**	CAN Bus (GH1.25 2p)
5	Power Button	**15**	RTC
6	PWM Fan	**16**	4Pin Switch
7	USB 3.0 Type A	**17**	Camera (#1) Connector 22pin 0.5mm
8	RJ45 1 (2.5G)	**18**	30Pin Expansion Interface
9	RJ45 2 (1000M)	**19**	M.2 M-key (2230)
10	Jetson Orin Module Interface (SODIMM)	**20**	M.2 E-key (2230)



Partial Features and Interfaces

Power interface (1)

The power interface uses the XT30PW-M36 connector, paired with the XT30U-F connector, as defined below.



- The recommended input voltage is 12V, and the supported voltage range is 10V-30V. The under-voltage protection(UVP) voltage is 9.5V, and the over-voltage protection(OVP) is 31V.

- The interface has reverse protection, but always verify the power polarity before connecting the power supply.

When using the ORIN NANO series, ensure the input power supply has a minimum output capacity of 45W. For the ORIN NX series, ensure the input power supply has a minimum output capacity of 60W.

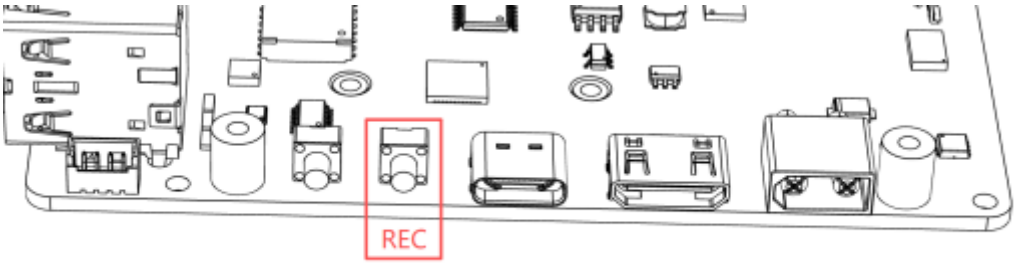
Module	Recommended power output	USB-C PD Supported Power Modes
ORIN NANO 4G/8G	45W	Minimum 20V 2.25A protocol
ORIN NX 8G/16G	60W	Minimum 20V 3A protocol

REC Button (4)

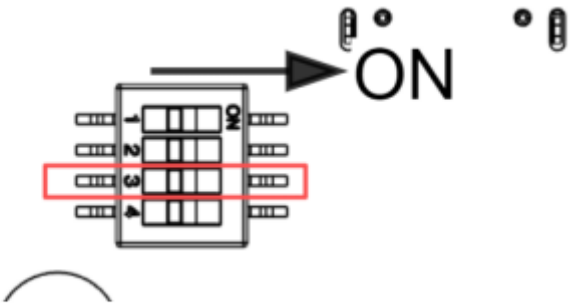
The C2401 carrier board supports two methods for entering recovery mode：

- When the power is off, press the REC button and turn on the power to enter recovery mode for operations like flashing.

  (Note: Recovery mode lasts only 60 seconds. The system will automatically resume normal startup after detecting no connection.)



- Set the DIP switch 3 on the back of the carrier board to ON, enabling the system to automatically enter recovery mode upon each power-on.

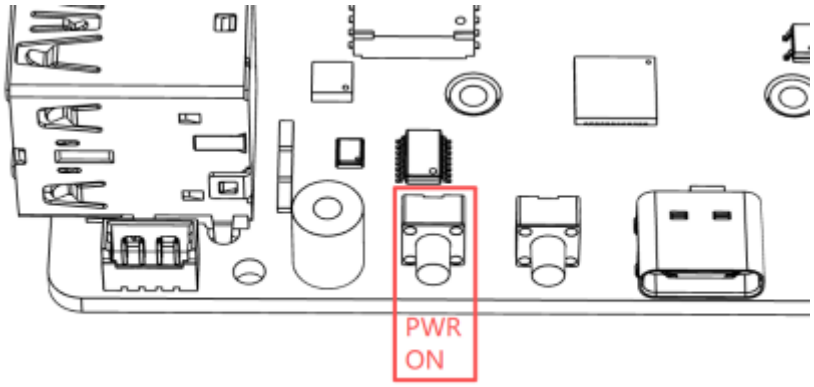


Power Button (5)

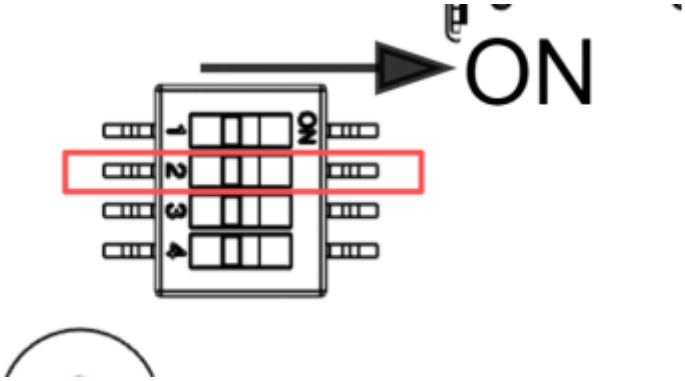
The C2401 unit is equipped with a power button (5) that performs the following functions:

When the system starts: Press once to enter the shutdown interface, and hold for 10 seconds to force shutdown.

When the system is shutting down: press once to start up.

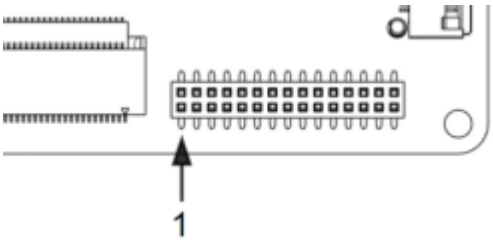


- Disable automatic startup: Set the DIP switch 2 on the back of the board to ON to disable automatic power-on. Manually press the power button to power on.



Expansion Header (18)

This is a **2x15-pin, 1.27mm pitch female header**. Pin 1 location and pin definitions are as follows:



VCC_IN	1	2	VCC_IN
VCC_IN	3	4	VCC_IN
GND	5	6	GND
USB_N	7	8	VDD_5V
USB_P	9	10	VDD_5V
GND	11	12	VDD_3V3
USBSS_RX_N	13	14	GPIO_13
USBSS_RX_P	15	16	GPIO_07
GND	17	18	SPI0_CS1
USBSS_TX_N	19	20	SPI0_CS0
USBSS_TX_P	21	22	SPI0_MOSI
GND	23	24	SPI0_MISO
PG	25	26	SPI0_SCK
CAM_I2C_SCL	27	28	UART0_TXD
CAM_I2C_SDA	29	30	UART0_RXD

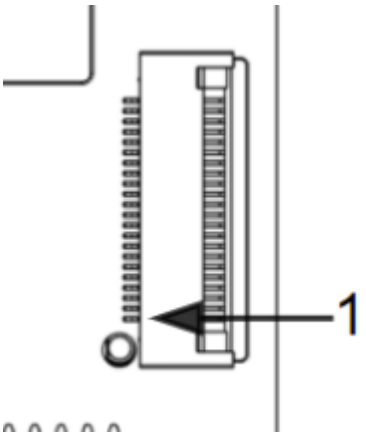
- The VCC IN voltage matches the input voltage (Pass-through), with a max current of 3A. **VDD_5V** and **VDD_3V3** provide up to 1A each.

- The I2C, GPIO, SPI, and UART pins operate at **3.3V**..

- PG signal: Outputs a high level (Active High) when the **module** is operating normally.

- USB 3.0 ports 13, 15, 19, and 21 are disabled by default in the official firmware. To enable them, please refer to the tutorial at: https://www.linkzeelabs.com/wiki/books/jetson-orin-nano/page/orin-nanonx-usb

CSI Interface (17)



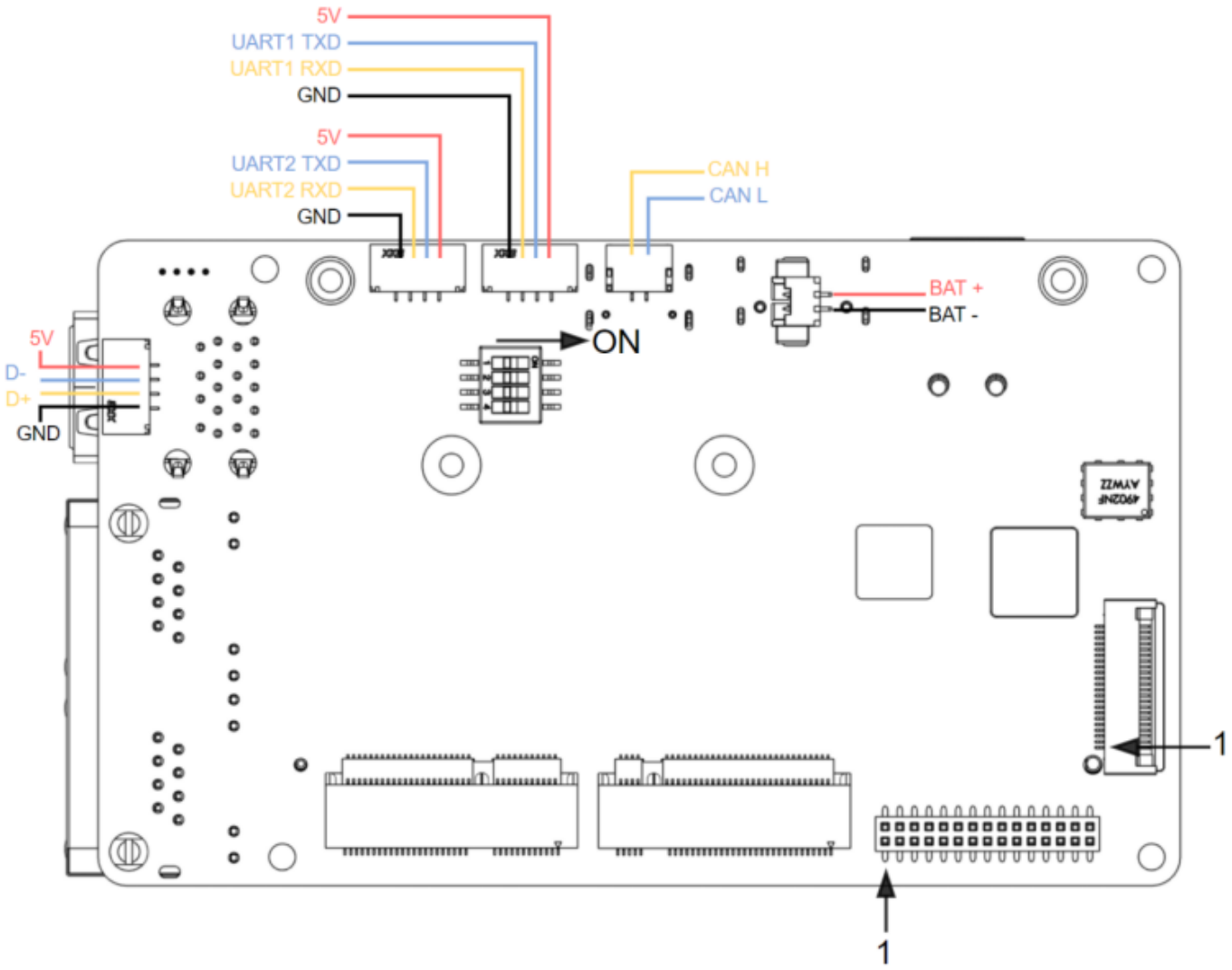
Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir
1	-	-	+3.3V	Power
2	CAM_I2C_SDA	215	Camera I2C. 2.2 kΩ pull-ups on module. The module CAM_I2C pins connect to an I2C mux. The camera connector #1 (J21) receives the I2C from the mux (second output). The I2C signals on the camera side of the mux have 1 kΩ pull-ups.	Bidir, 3.3V
3	CAM_I2C_SCL	213		Output, 3.3V
4	-	-	Ground	Ground
5	CAM1_MCLK	122	Camera #0 Primary Clock	Output, 1.8V
6	CAM1_PWDN	120	Camera #0 Power-down	Output, 1.8V
7	-	-	Ground	Ground
8	CSI3_D1_P	35	CSI 3 Data 1	Input
9	CSI3_D1_N	33		
10	-	-	Ground	Ground
11	CSI3_D0_P	23	CSI 3 Data 0	Input
12	CSI3_D0_N	21		
13	-	-	Ground	Ground
14	CSI2_CLK_P	30	CSI 2 Clock	Input
15	CSI2_CLK_N	28		
16	-	-	Ground	Ground
17	CSI2_D1_P	36	CSI 2 Data 1	Input
18	CSI2_D1_N	34		
19	-	-	Ground	Ground
20	CSI2_D0_P	24	CSI 2 Data 0	Input
21	CSI2_D0_N	22		
22	-	-	Ground	Ground

Note: In the Type/Dir column, Output is to camera module. Input is from camera module. Bidir is for bidirectional signals.

Legend	Ground	Power	Reserved

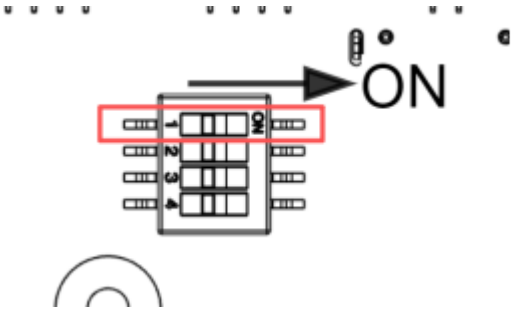
For the CSI camera interface usage tutorial, please refer to: https://www.linkzeelabs.com/wiki/books/jetson-orin-nano/page/b534b

USB, Serial Port, and CAN

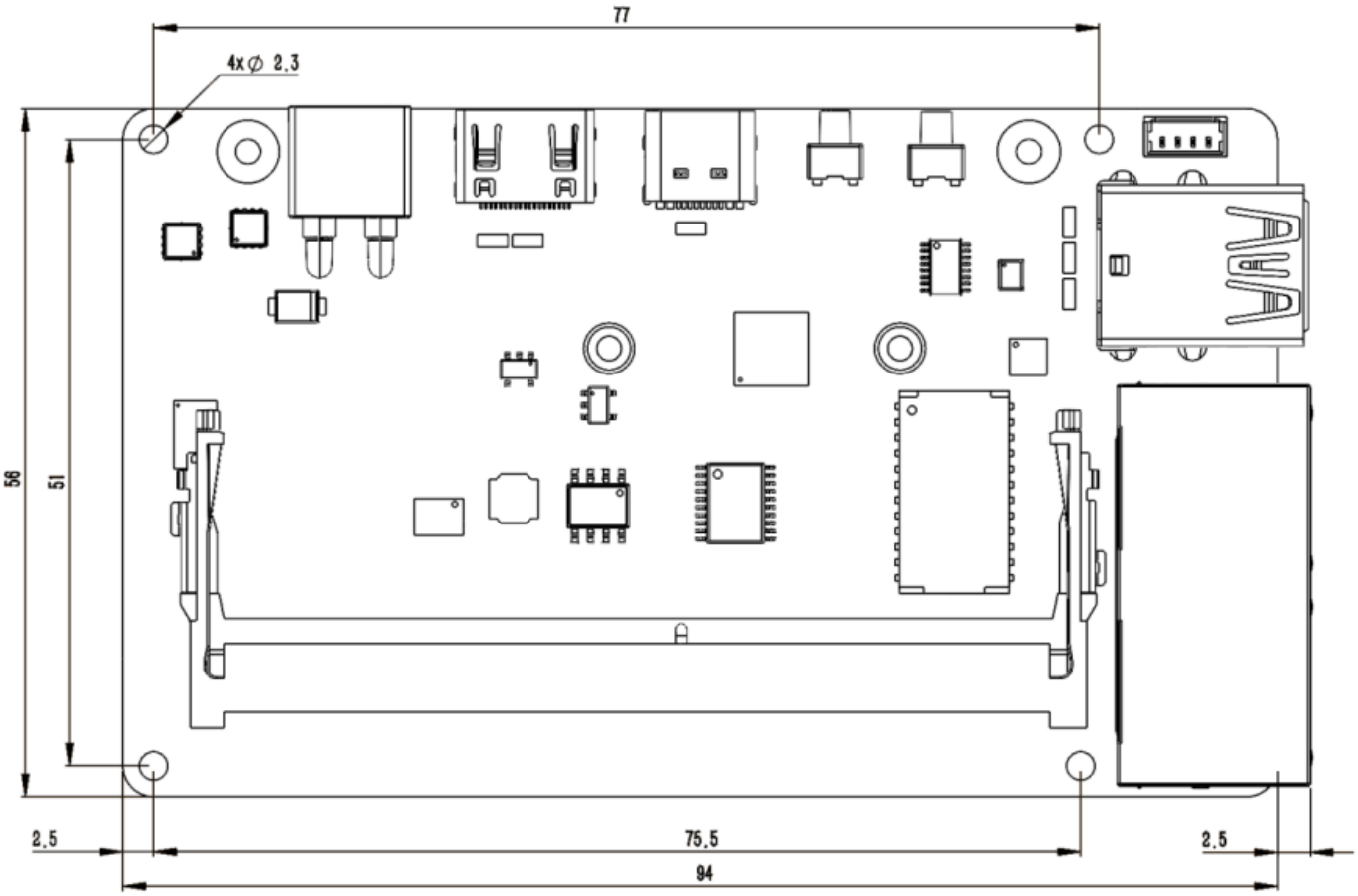


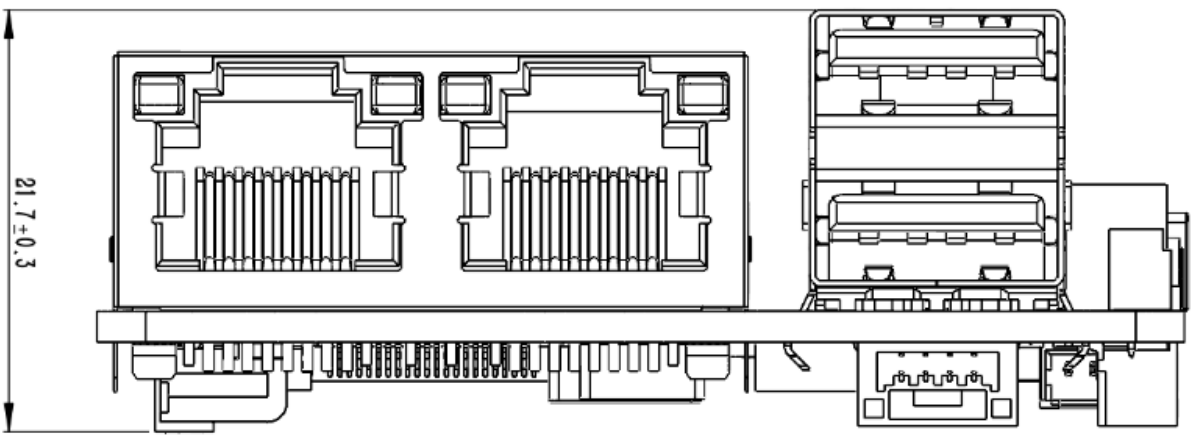
- RTC battery port (15): MX1.25-2P connector. When installing a battery, ensure correct polarity. **Note:** Software configuration is required to enable the **RTC** after installation.

The CAN interface (14): GH1.25-2P connector. Default state: No termination resistor. Set DIP switch 1 to ON to **enable the built-in** 120? termination resistor.



- UART (12) and (13): GH1.25-4P connectors with **3.3V logic levels**. UART2 is reserved for **DEBUG mode**. The 5V output supports a maximum current of 0.5A.
- The USB2.0 port (11): GH1.25-4P connector. Supports a maximum 5V output current of 0.5A.





For details on RTC configuration and UART interface usage, please refer to https://www.linkzeelabs.com/wiki/books/jetson-orin-nano/page/3c778

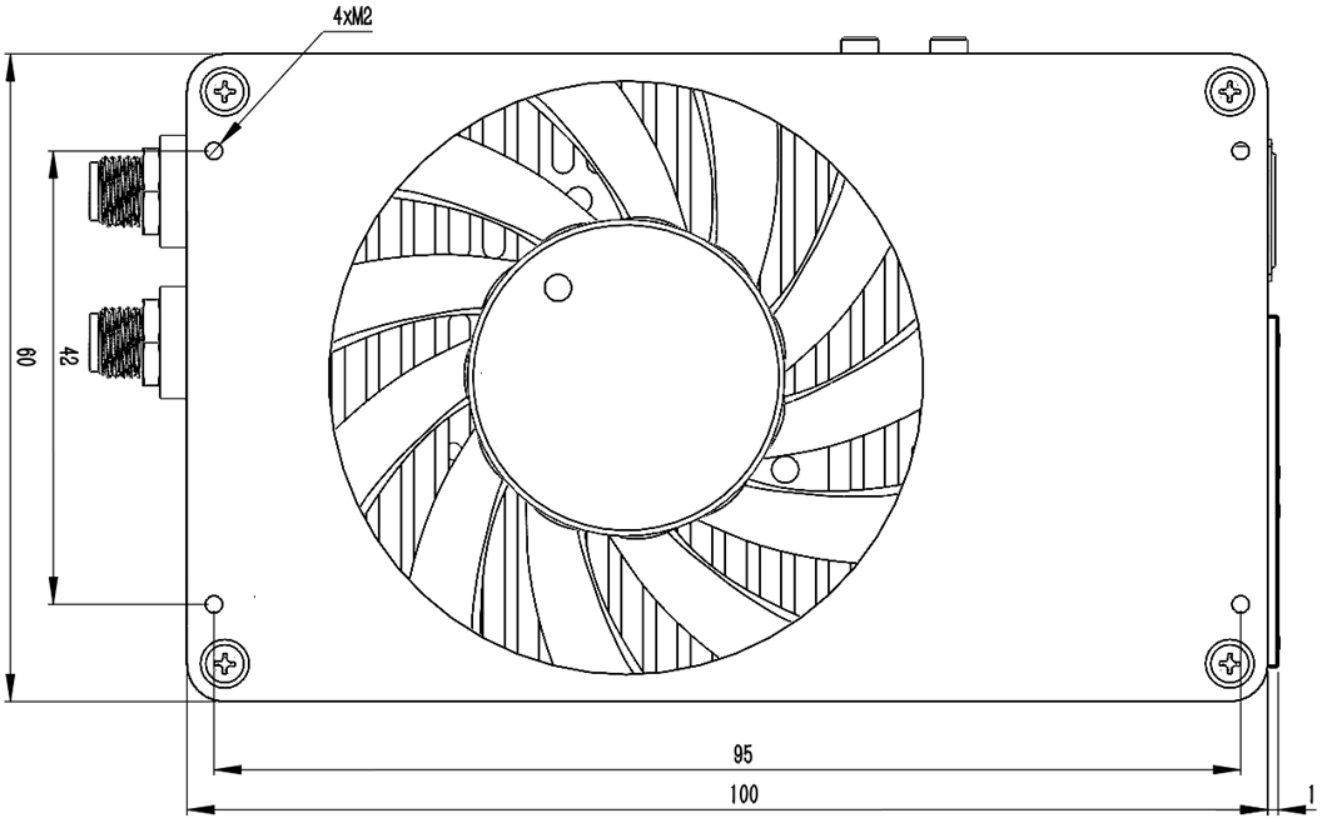
RJ45??

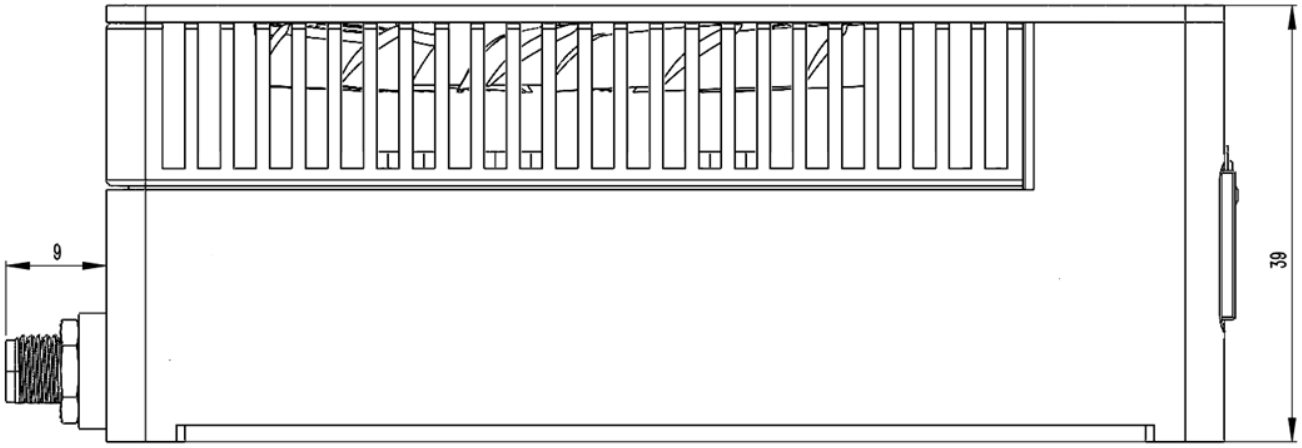
- 千兆网口 **(8)**：使用与原厂一致的 **RTL8111**千兆网卡 芯片，无需额外调试驱动。
- **2.5G**网口 **(9)**：使用 **RTL8125 2.5G**网卡，启用需要额外安装驱动，具体说明参考 有线网卡驱动设置_____。

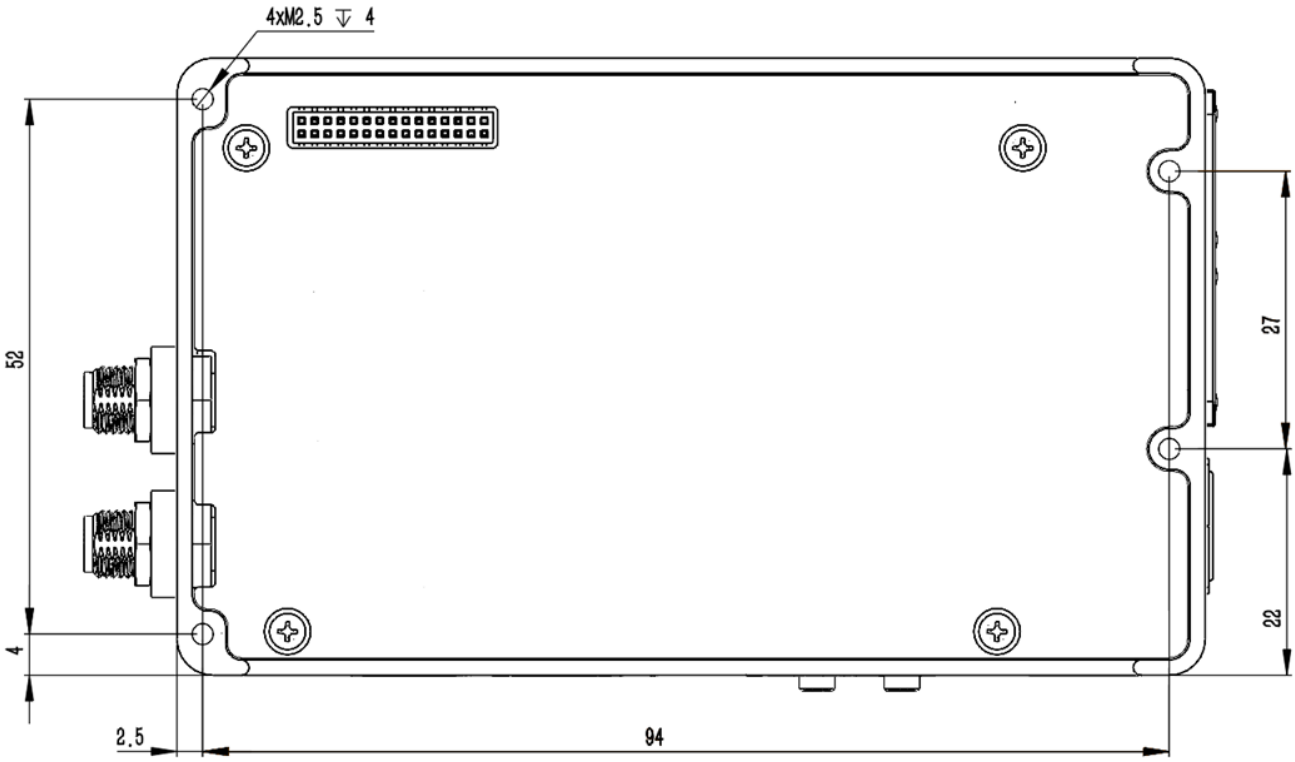
Mechanical Dimensions (Unit: mm)

Screw Location?	Recommended Specification?	Note?
Carrier Board Mounting Holes	M2 screws or standoffs	The diameter of the screw or standoff must not exceed 4.5mm.
Module	M2.5 × 4 pan head screws	The diameter of the screw or standoff must not exceed 5mm.
Hard Drive & Network Card	M2.5 × 4 pan head screws	Pan head screws are recommended.

Kit Dimensions (Unit: mm)







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- Jetson Orin C2401 刷机教程
- Jetson 基础教程
- JetPack 配置说明
- Jetson AI 视觉教程
- Jetson 大模型教程

版本号 #4
由 edit 创建于 4 四月 2026 05:56:13
由 edit 更新于 5 四月 2026 11:49:49