



User Manual

NVIDIA Jetson Orin AI Machine Vision Controller | AIPC-611&AIPC-612 User Manual

AICOTEK

Empowering the world with AI solutions



AIPC-611& AIPC-612 User Manual

History

Revision History	Changes	Date
Ver1.0	First Edition	2026/07/17

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Safety Precautions

- (1) Please read and follow the safety precautions before you are going to use it.
- (2) Pay attention to the labels on the product.
- (3) Make sure to use in an environment that meets the design specifications, otherwise, malfunction or partial damage caused by non-compliance with relevant regulations is not covered under the product quality guarantee.
- (4) Please unplug the power cord and do not use liquids to clean the PC.
- (5) Please keep the PC in a safe space to prevent it from falling and damaging its components.
- (6) Please keep the power cord in a safe location to avoid causing personal injury.
- (7) Please do not bundle control wires, communication cables and power wires together, it would be better to keep a distance of at least 100mm between them to avoid mutual interference.
- (8) It is recommended to use wires with isolation, especially in environments with severe electromagnetic interference.
- (9) Please disconnect it from the power socket if the PC is not used for a long time.
- (10) Please make sure that no liquids enter the device to avoid the risk of fire or short circuit.
- (11) Please disconnect the power cord before opening the computer case.
- (12) Please clean the dust regularly.
- (13) Please ask for technical support and return the PC to RMA:
 - The power cord or plug is damaged;
 - Liquid has entered the interior of the PC;
 - PC doesn't work;
 - PC is damaged;
 - Physical damage on the PC.

Chapter 1 System Overview

1.1 System Introduction

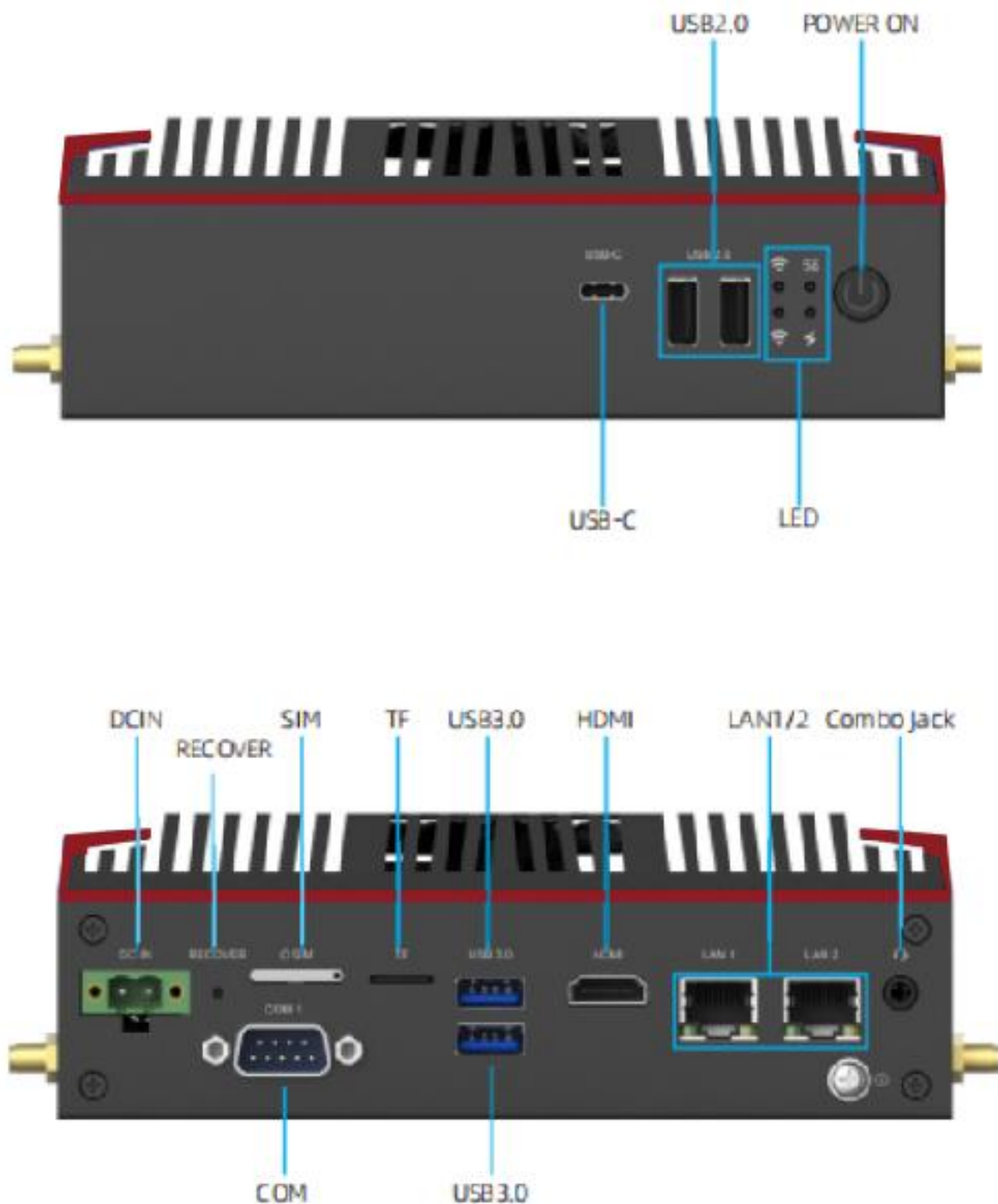
AIPC-611 & AIPC-612 is a fan-equipped NVIDIA AI BOX that comes with an NVIDIA Jetson AGX Orin module, delivering up to 100 TOPS of AI performance. It is compatible with the NVIDIA JetPack SDK ecosystem and offers a rich set of development tools and a pre-trained model library. It is an ideal choice for accelerating edge deep learning. It supports multiple network connection methods such as RJ45, WiFi, 4G/5G. This product is designed with multiple interfaces, integrating industrial communication interfaces such as RS-232/485 serial ports and CAN buses, as well as multiple digital input/output terminals. It fully meets the demands of the AI computing field, provides rich connection capabilities, and ADAPTS to complex scenarios.

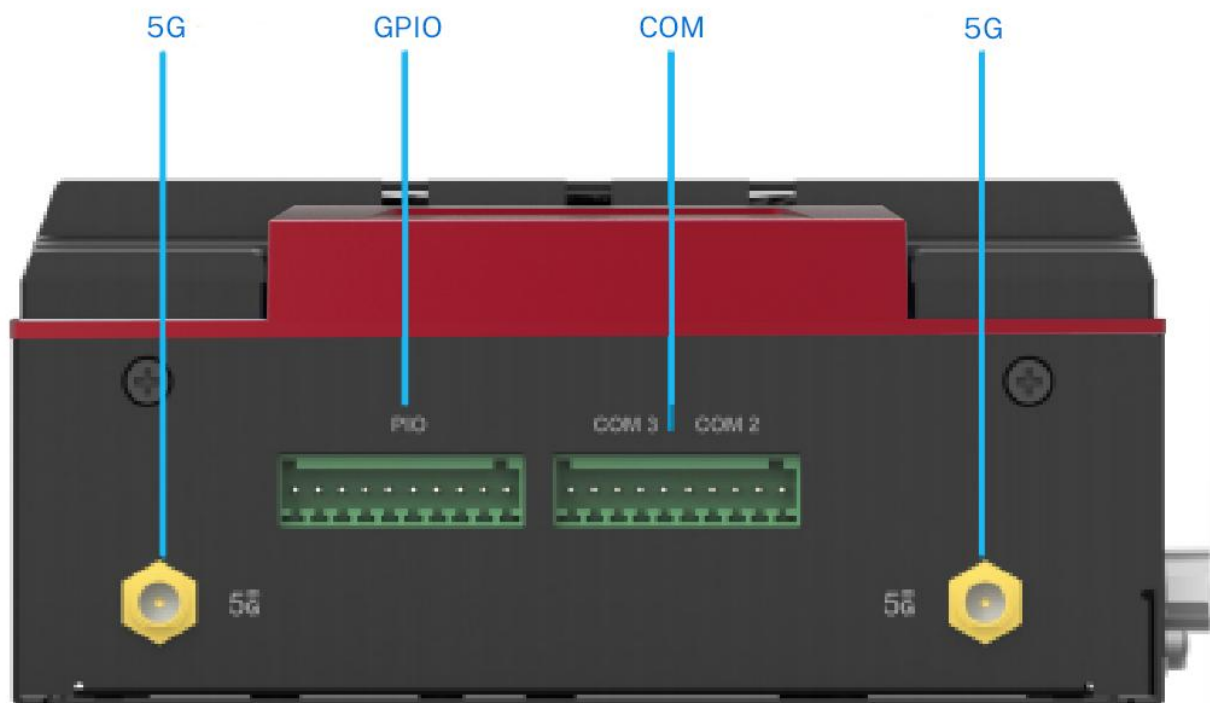
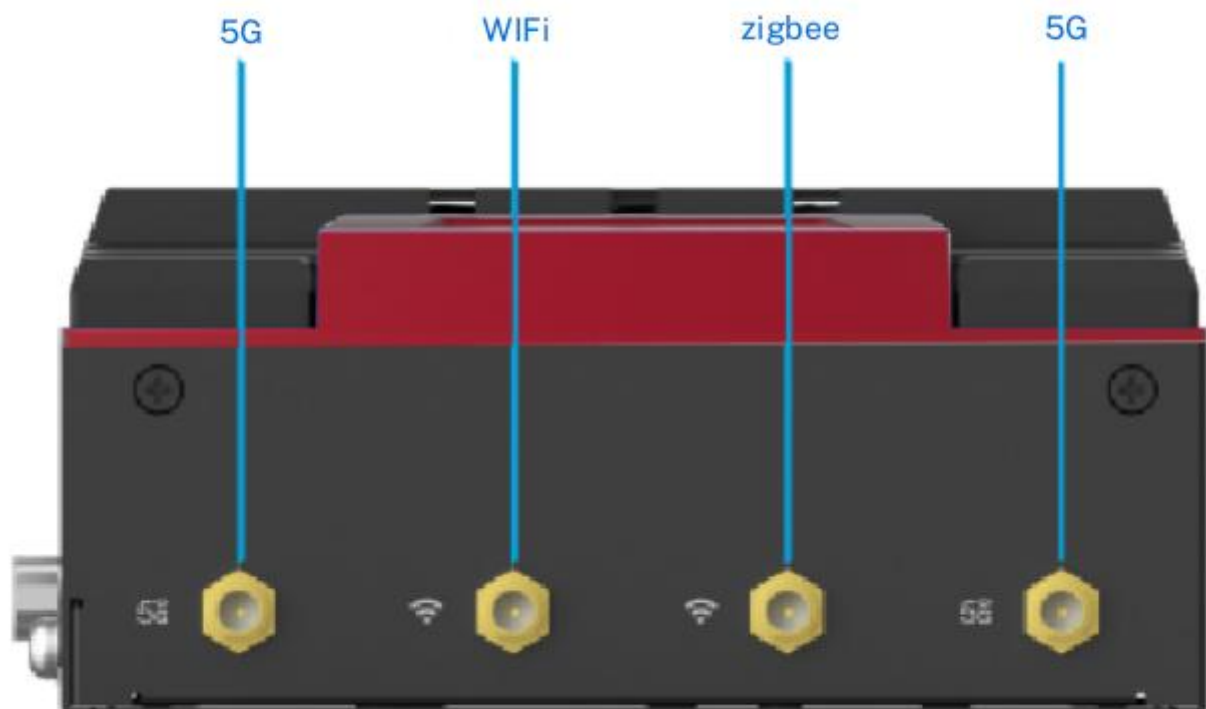


1.2 Product Specifications

Model Name	AIPC-611& AIPC-612			
ORIN module	Jetson Orin Nano 4GB	Jetson Orin Nano 8GB	Jetson Orin NX 8GB	Jetson Orin NX 16GB
CPU	6 core Arm® Cortex®-A78,1.5Ghz		6 core A78,2.0Ghz	8 core A78,2.0Ghz
GPU	Ampere, 512 CUDA Cores, 16 Tensor Cores, 625Mhz	Ampere, 1024 CUDA Cores, 48 Tensor Cores, 625Mhz	Ampere, 1024 CUDA Cores, 32 Tensor Cores, 765Mhz	Ampere, 1024 CUDA Cores, 32 Tensor Cores, 918Mhz
NPU	20TOPS Int8	40TOPS Int8	70TOPS Int8	100TOPS Int8
Memory	LPDDR5 4GB	LPDDR5 8GB	LPDDR5 8GB	LPDDR5 16GB
Storage	1 x M.2 2280 NVME SSD expansion 1 x TF expansion			
LAN	2 x RJ45, 10/100/1000 Mbps			
WiFi/BT	1xM.2 Key-B, expandable 4G/5G module, 1X M.2 Key-E, expandable WIFI/BT module, optional wifi 5/ wifi 6 1X Mini-PCIe, expandable Lora wireless support(optional)			
Display	1x HDMI Out , up to 4k@30Hz		1x HDMI Out , up to 4k@60Hz	
Audio	1 x 3.5mm Combo jack(CTIA)			
USB	2 x USB3.0 Type-A, 2 x USB2.0 Type-A; 1 x TYPE-C（USB3.0&OTG）			
COM	1 x 10-pin Phoenix terminal (1*RS232 + 1*RS485), 1 x DB9 socket (RS232/485 selectable) 1 x 4-pin connector (RS232/TTL optional)			
GPS	On-board GPS module (optional)			
TPM/TCM	Built-in National Technology TCM Module (Z32H330TC)			
Expansion	1 x 10-pin Phoenix terminal (4 input channels, 4 output channels) 1 x SIM card slot, 1 x JPWR_ON 2 x JLED pins, 1 x CAN pin 1 x CPU FAN pin 1 x Buzzer 1 x Recovery button			
DC IN	DC IN Phoenix Terminal			
Size	187x 131x 54mm (7.4x5.2x2.1 in)			
OS	Ubuntu20.04			

1.3 External I/O

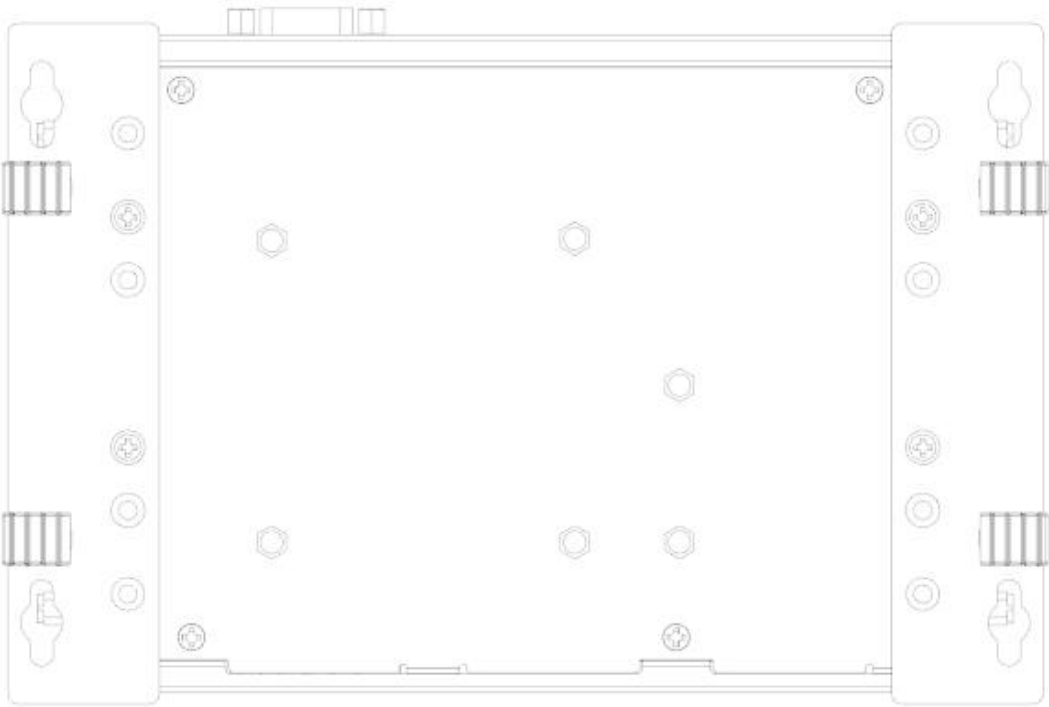
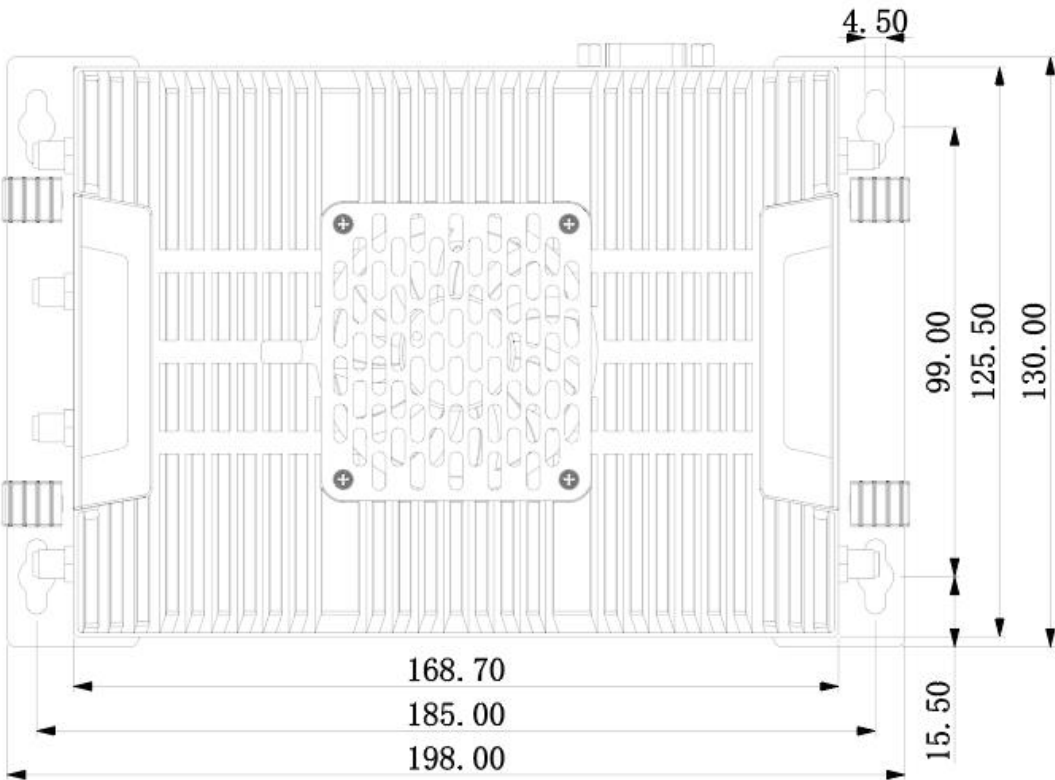


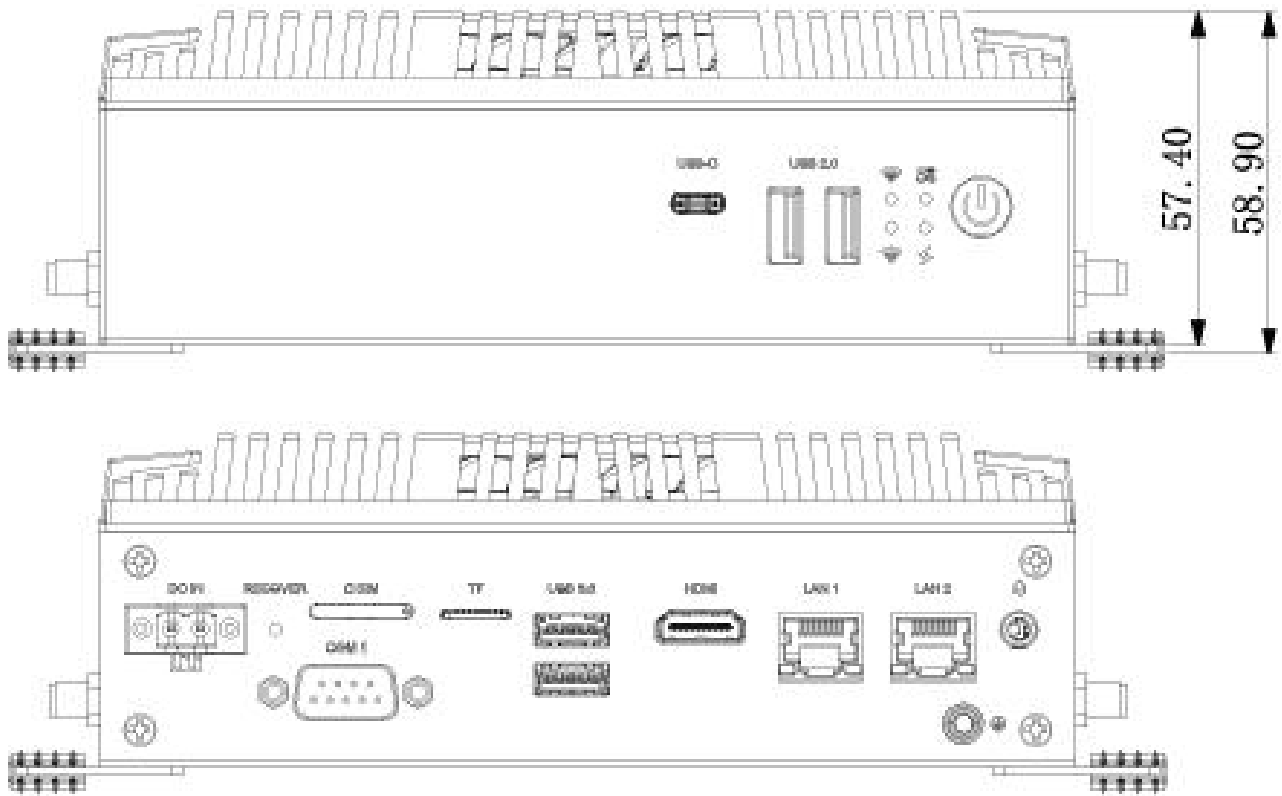


ote: This illustration is for reference only. Please refer to the actual product for accuracy. The jumpers or sockets marked in the above images should be referenced according to the introduction in the 'Interface Function Description' section.

1.4 Dimensions

Unit: mm





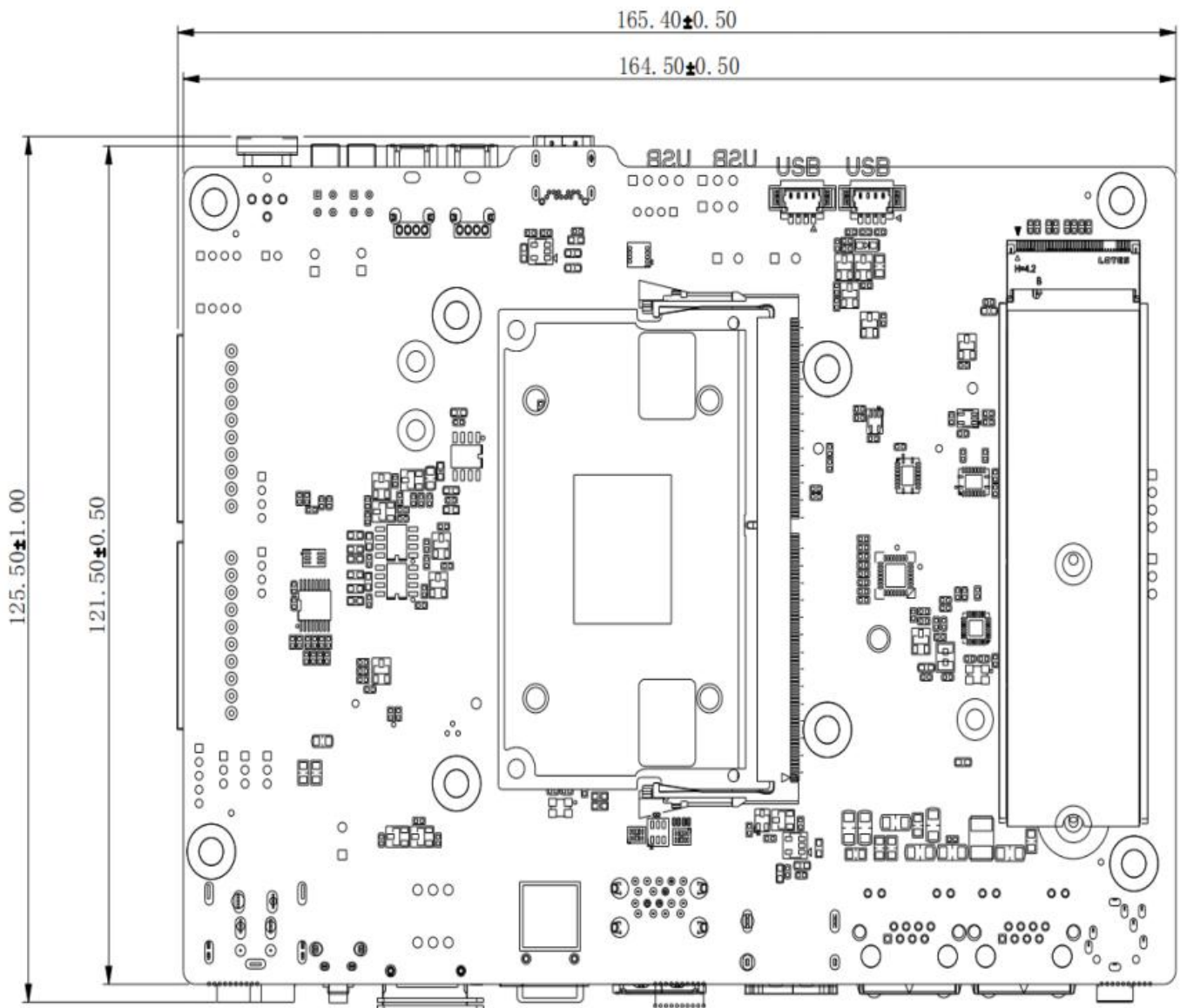
1.4.1 Interface Function Description (Please refer to the 'Appearance Diagram' for this section)

- USB-C: Type-C connection port.
- USB2.0: USB2.0 connection port (compatible with USB1.1 devices).
- LED: 1 DC power indicator light, which turns red when powered on; 1 4G/5G indicator light, which flashes green during operation; 1 WIFI indicator light, which flashes red during operation; 1 Zigbee indicator light, which flashes green during operation.
- POWER ON: Power-on button.
- DC_IN: DC power input interface.
- RECOVER: Reset button.
- COM: Serial port.
- SIM: SIM card slot.
- TF: TF card slot.
- USB3.0: USB3.0 connection port (compatible with USB2.0 devices).
- HDMI: High-definition multimedia display interface.

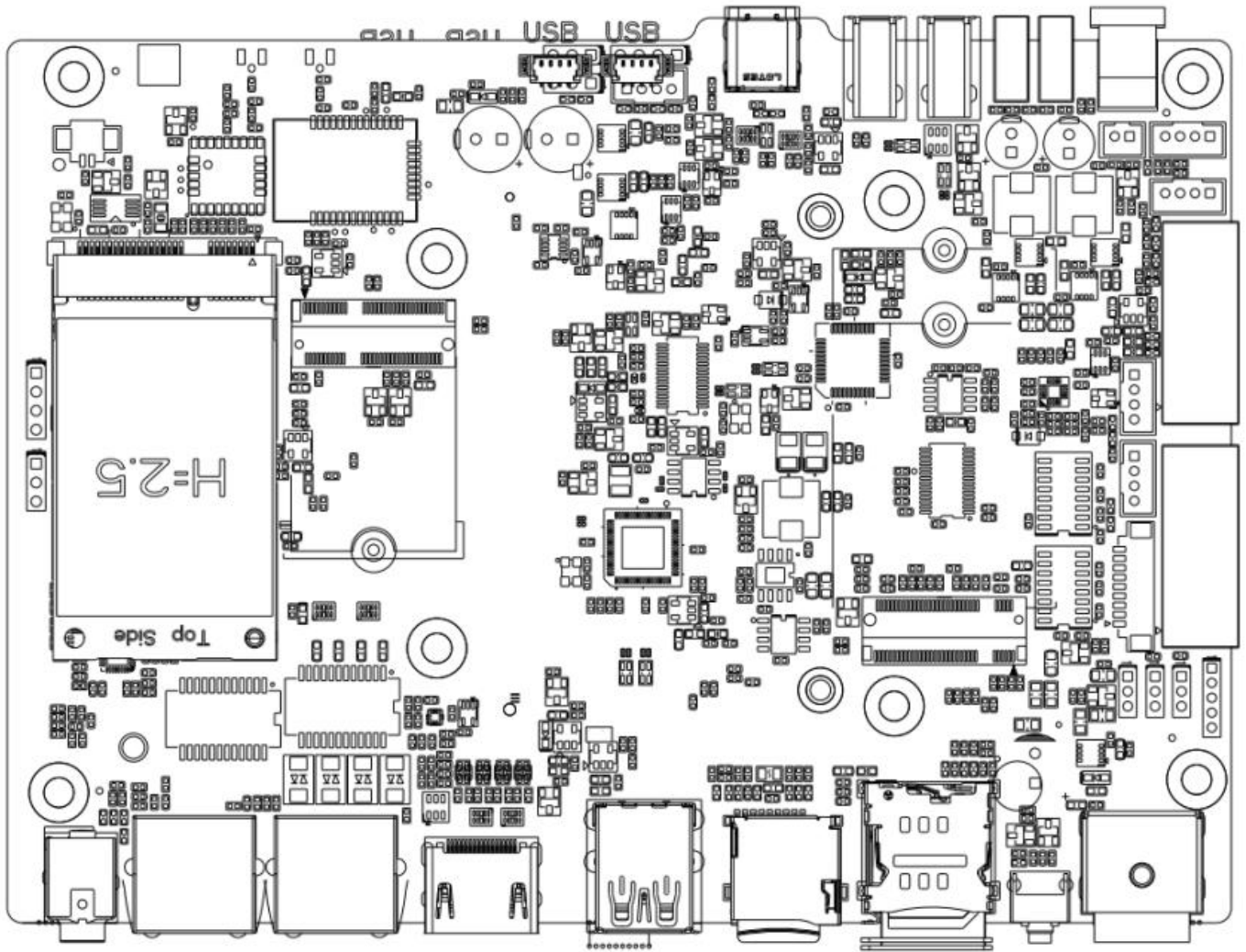
- LAN1/2: RJ45 Ethernet interfaces.
- Combo Jack: Combo interface.
- Antenna: 5G antenna, WIFI antenna, Zigbee antenna, 5G antenna.
- GPIO: 3 GPI + 3 GPO (Phoenix terminal).
- COM: 1 RS232 + 1 RS485 (Phoenix terminal)

1.5 Structure diagram of motherboard

1.5.1 Base board structure diagram



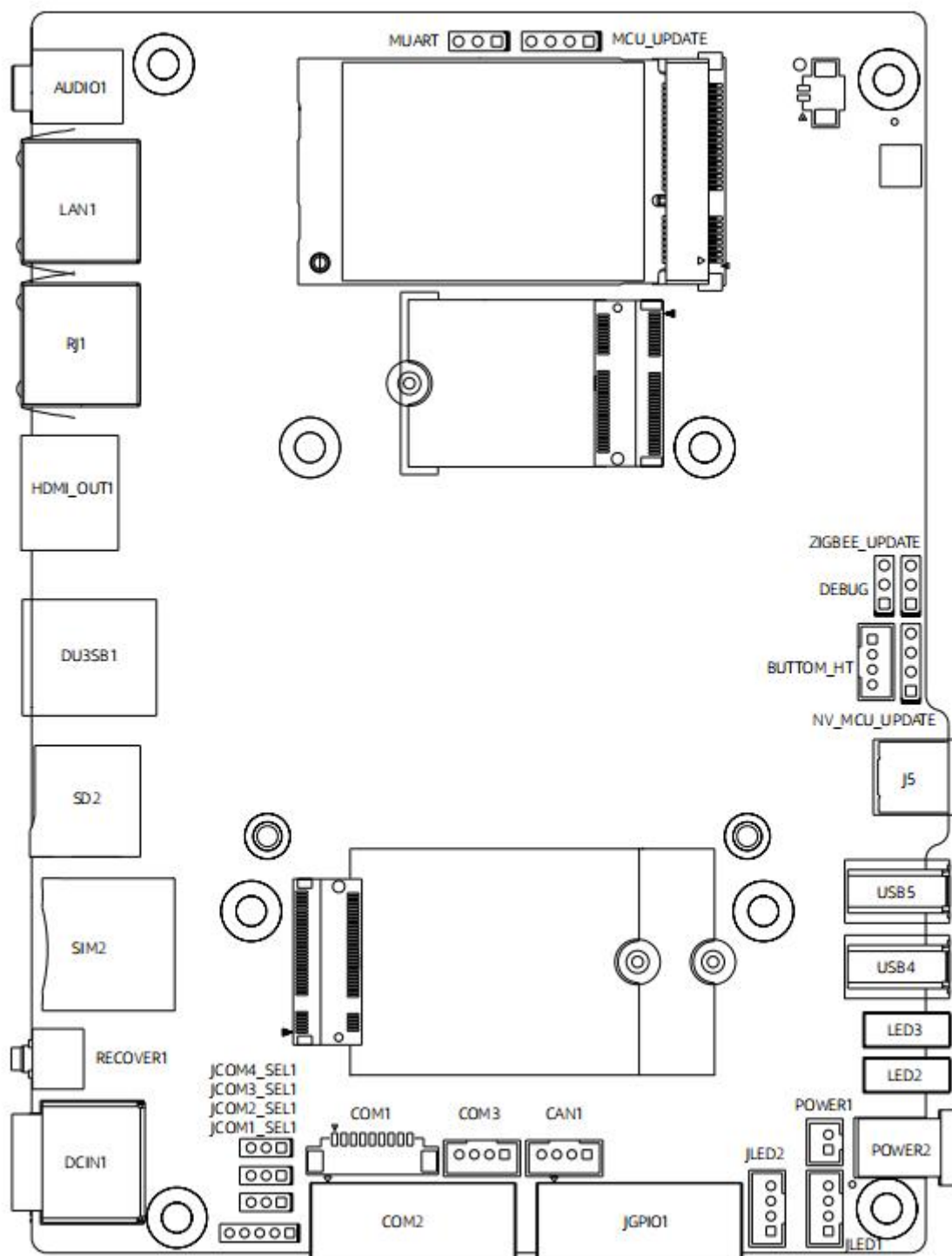
(This picture is for reference only, please refer to the actual object.)



(This picture is for reference only, please refer to the actual object.)

1.6 Motherboard layout diagram

1.6.1 Base board layout



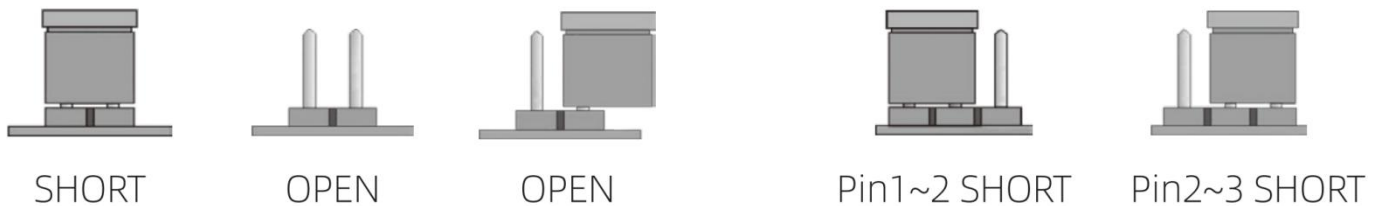
(This picture is for reference only, please refer to the actual object.)

Chapter 2 Onboard interface definition

2.1 Jumper and socket introduction

2.1.1 Jumper setup instructions

2-pin header: Inserting a jumper cap into the two pins will short them (close the circuit); removing the jumper cap or inserting it into other pins (reserved for future expansion) will open the circuit. 3-pin header: The jumper cap can be inserted between pins 1-2 or pins 2-3 to short them (close the circuit).



How to identify the first foot position of the jumper?

1. Please check the motherboard carefully. Any pin marked "1" or marked with white thick line is the position of foot 1.
2. Look at the pad of the back plate, usually the square pad is the first foot.

2.1.2 Jumper settings

COM1_SEL1 jumper set (DB9 Power Selection)

Pin	Definition
1	12V
2	COM1(VCC1)
3	5V
4	COM1(VCC1)
5	5V

COM2_SEL1 jumper set (COM2 Pin 1 Power Selection)

Pin	Definition
1	12V
2	COM2(VCC2)
3	5V

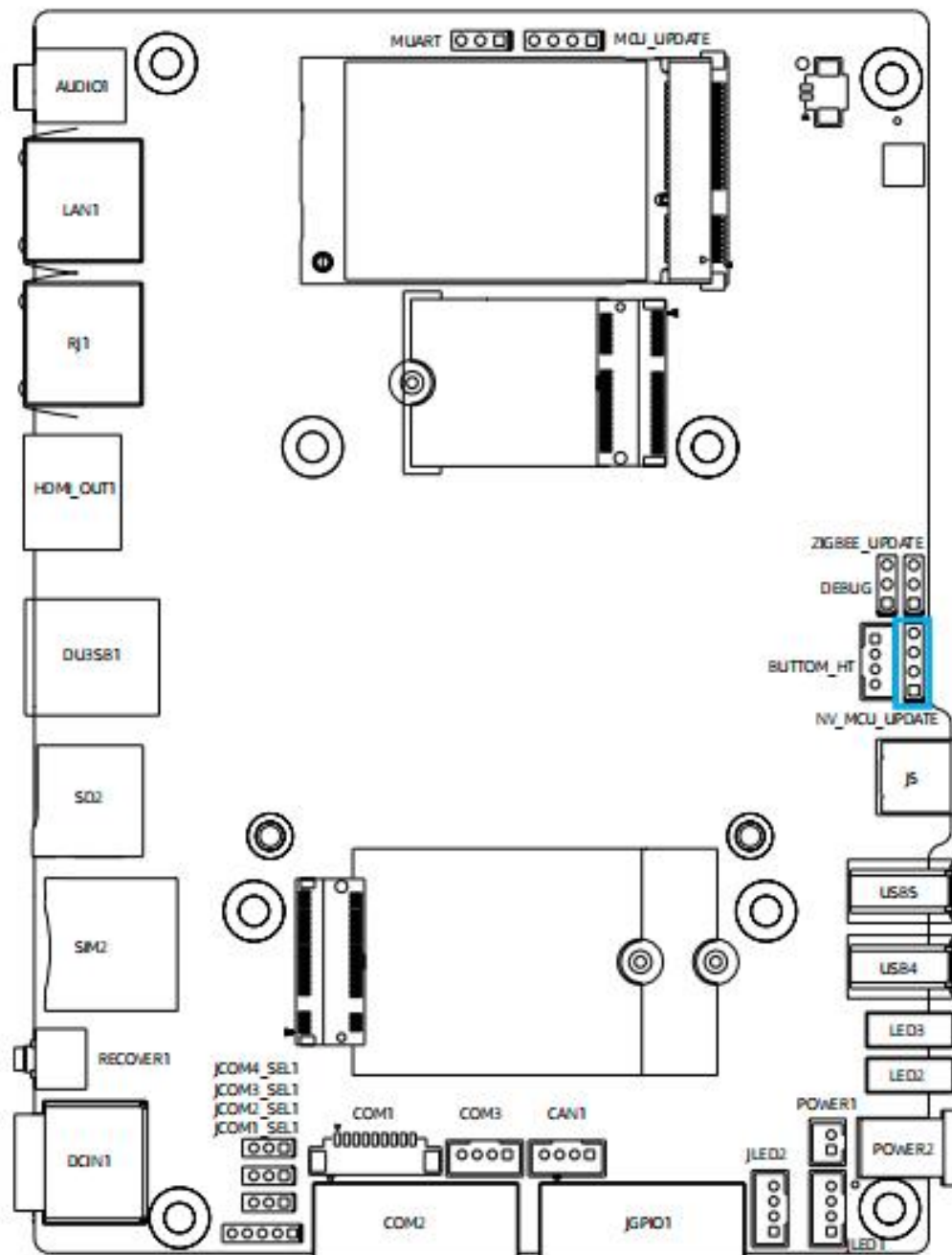
COM3_SEL1 jumper set (COM2 Pin 6 Power Selection)

Pin	Definition
1	12V
2	COM2(VCC3)
3	5V

COM4_SEL1 jumper set (COM3 Power Selection)

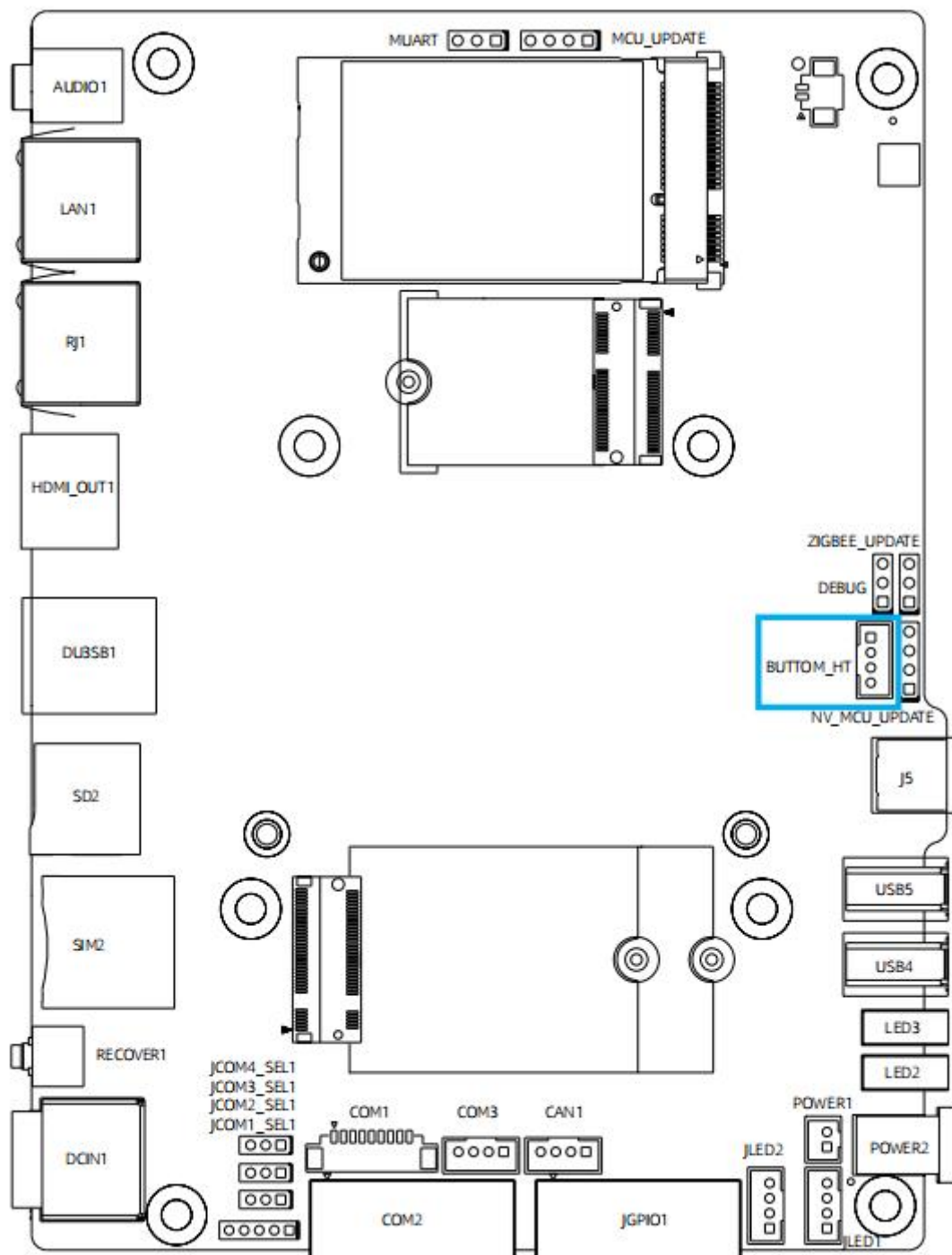
Pin	Definition
1	12V
2	COM3(VCC4)
3	3.3V

2.2 NV_MCU_UPDATE pin interface



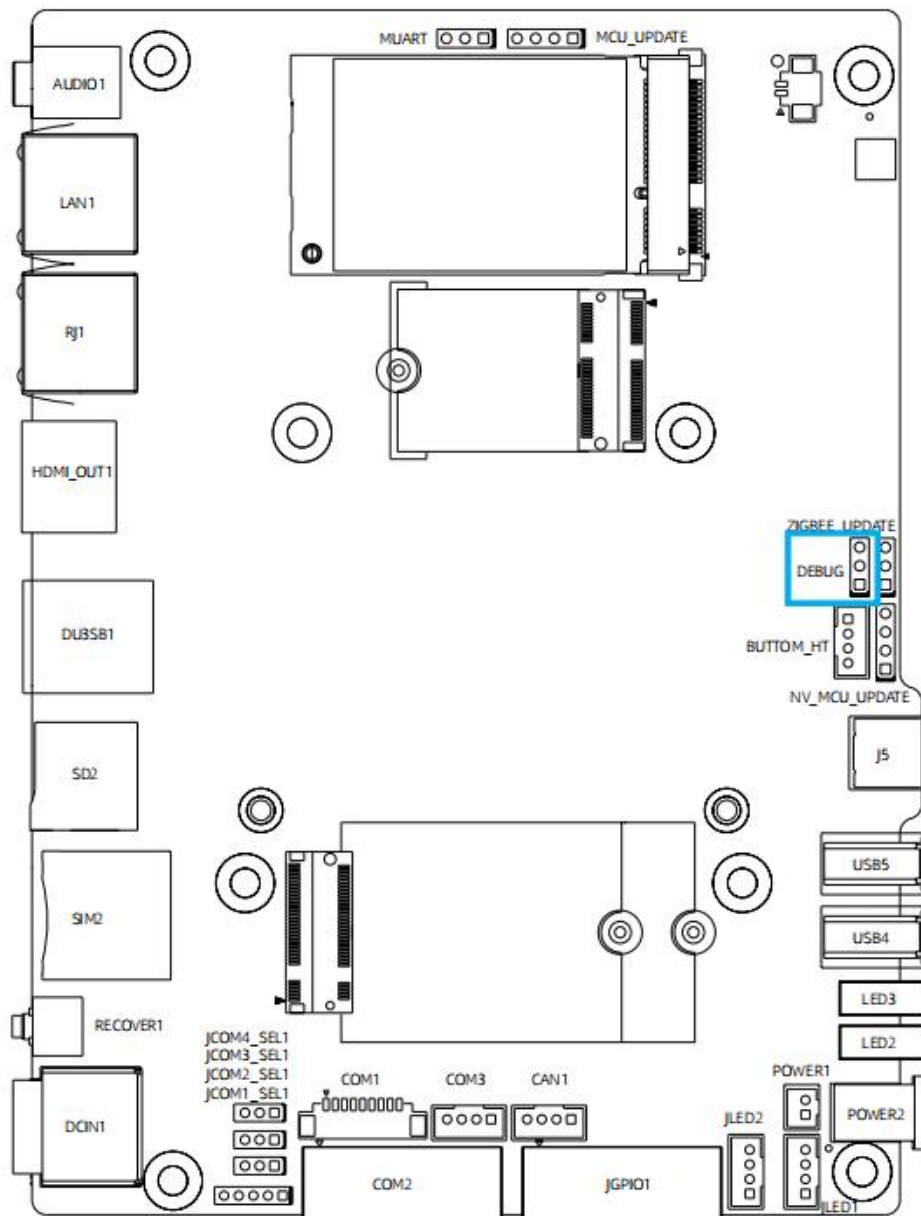
Pin	Definition
1	NC
2	C2D
3	C2C
4	GND

2.3 BOTTOM_HT pin interface



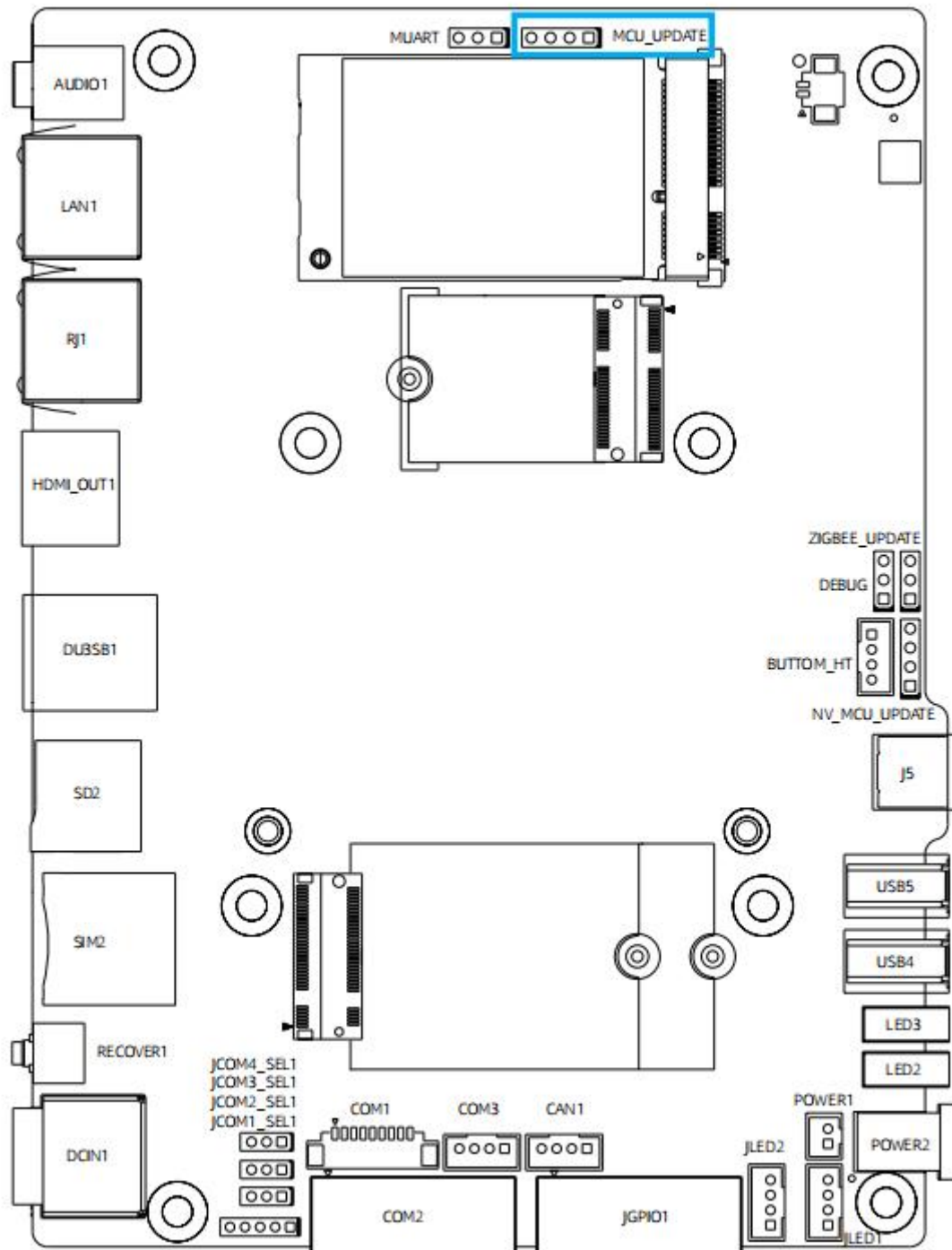
Pin	Definition
1	ACOK
2	DIS
3	GND
4	RST

2.4 DEBUG pin interface(Jetson sys debug)



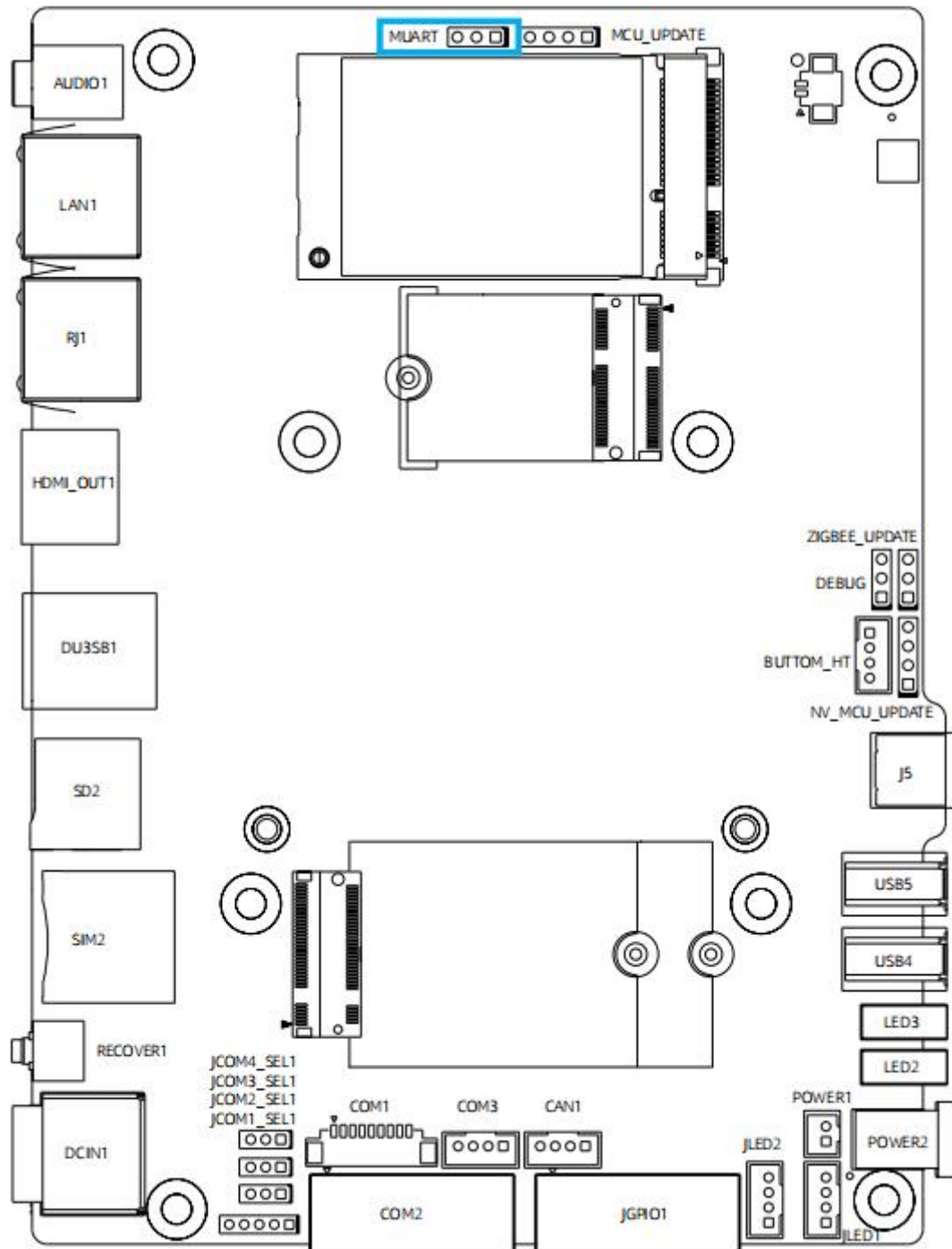
Pin	Definition
1	CLK
2	DIO
3	GND

2.5 MCU_UPDATE pin interface(Mini54 MCU)



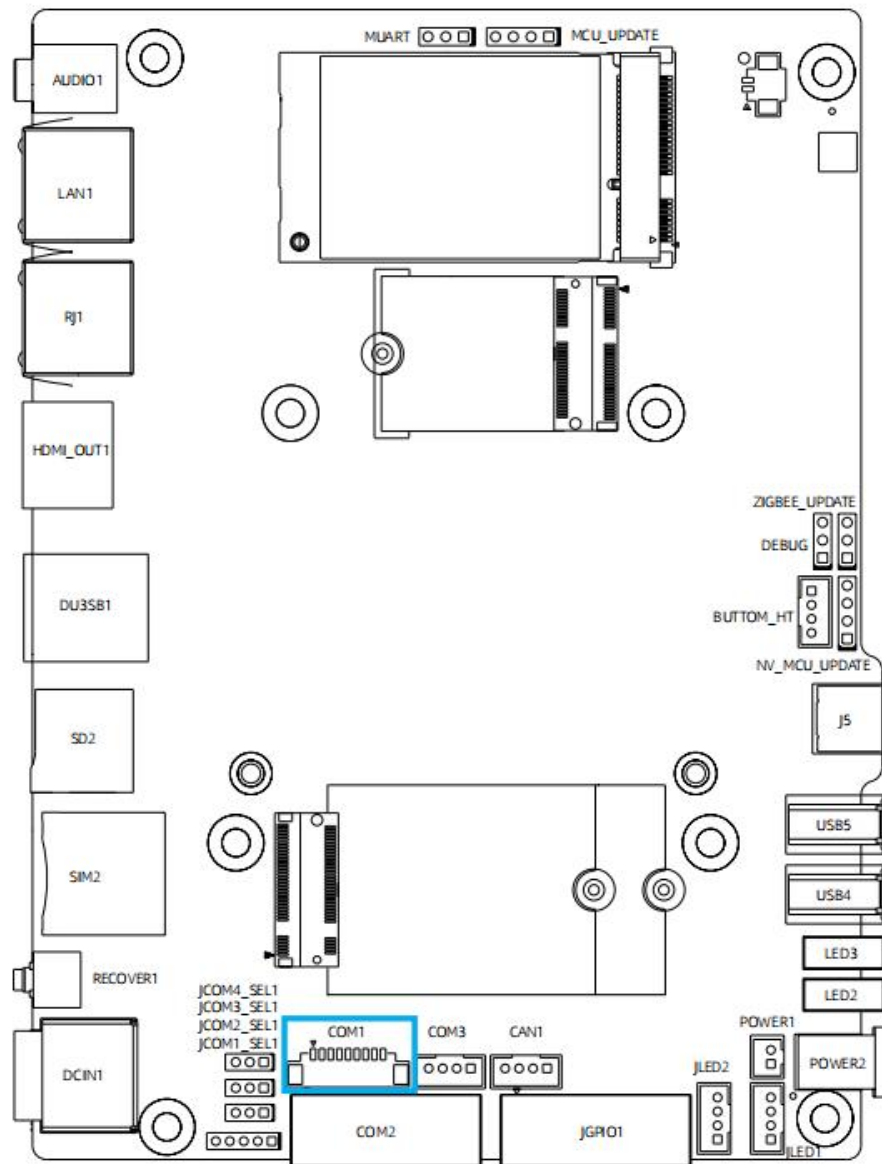
Pin	Definition
1	RST
2	DAT
3	CLK
4	GND

2.6 MUARTpin interface(MINI54 Dubug Port)



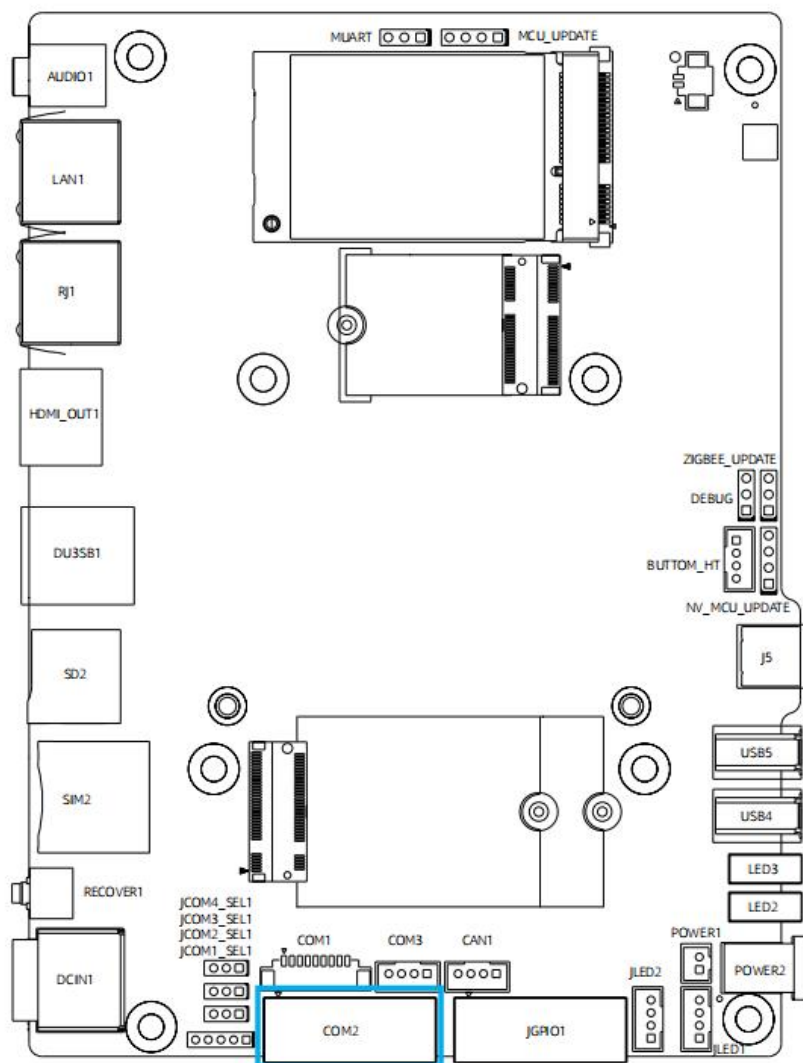
Pin	Definition
1	RX
2	TX
3	GND

2.7 COM1 pin interface



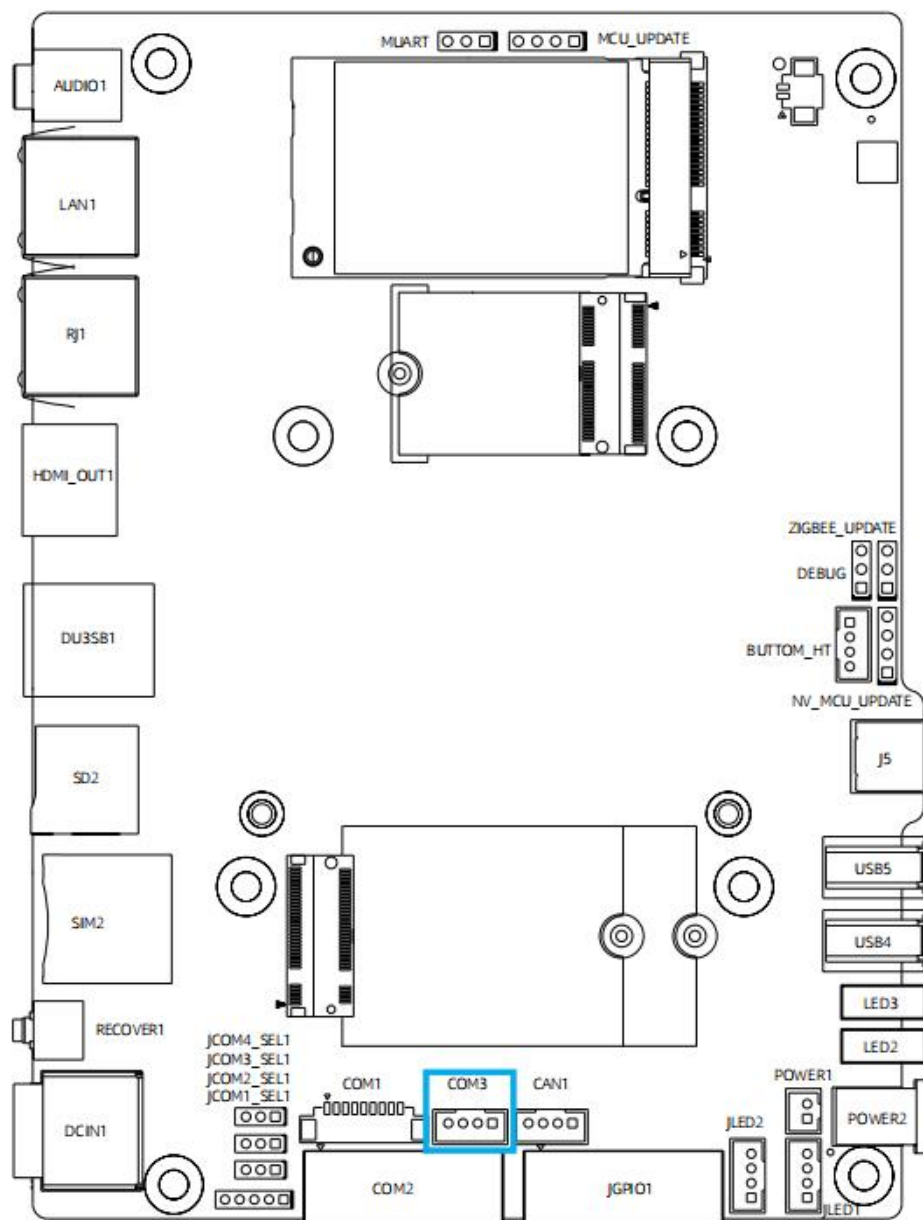
Pin	Definition
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	VCC1

2.8 COM2 pin interface



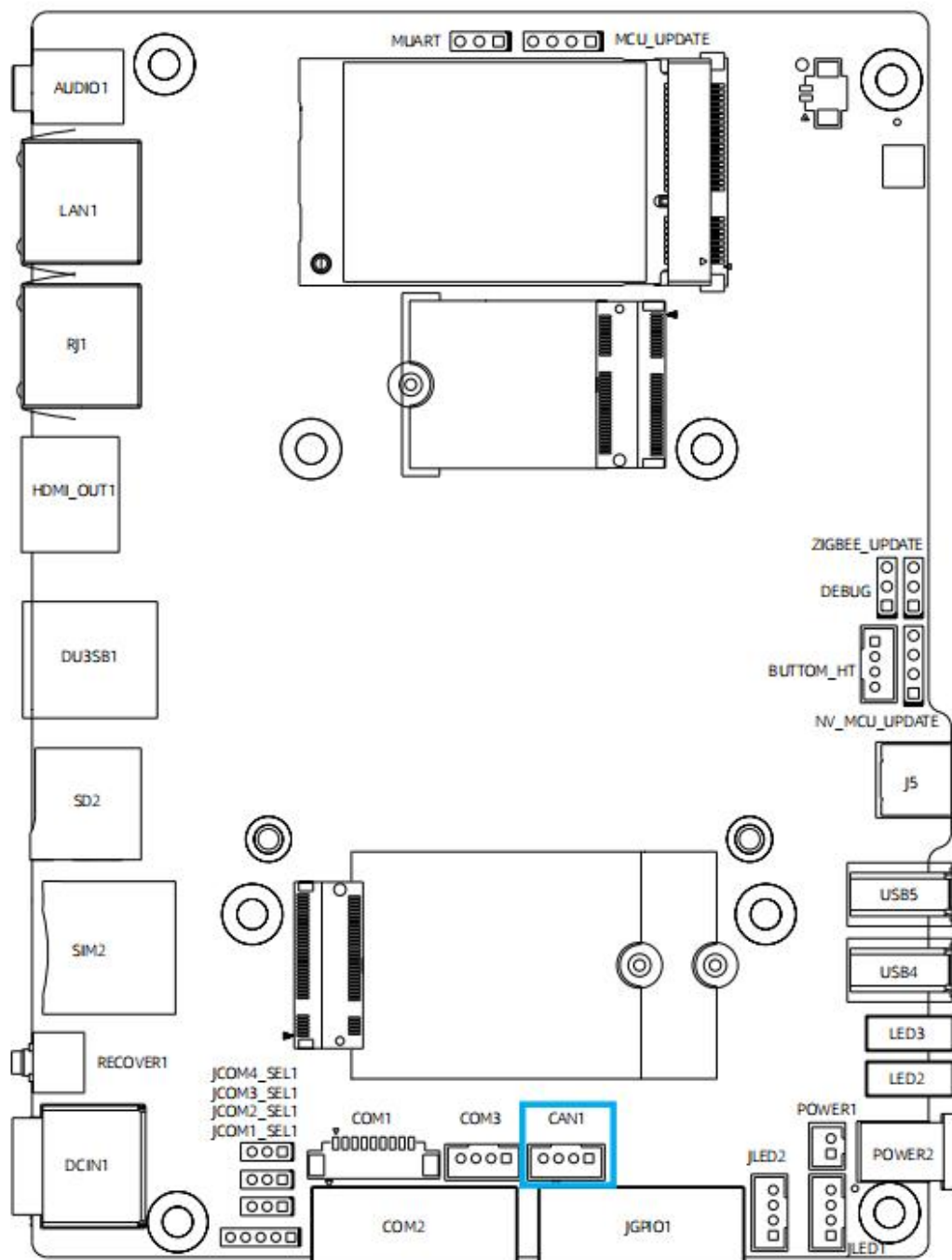
Pin	Definition
1	VCC2
2	TX_RS232
3	RX_RS232
4	GND
5	NC
6	VCC3
7	RX_RS485
8	TX_RS485
9	GND
10	NC

2.9 COM3 pin interface



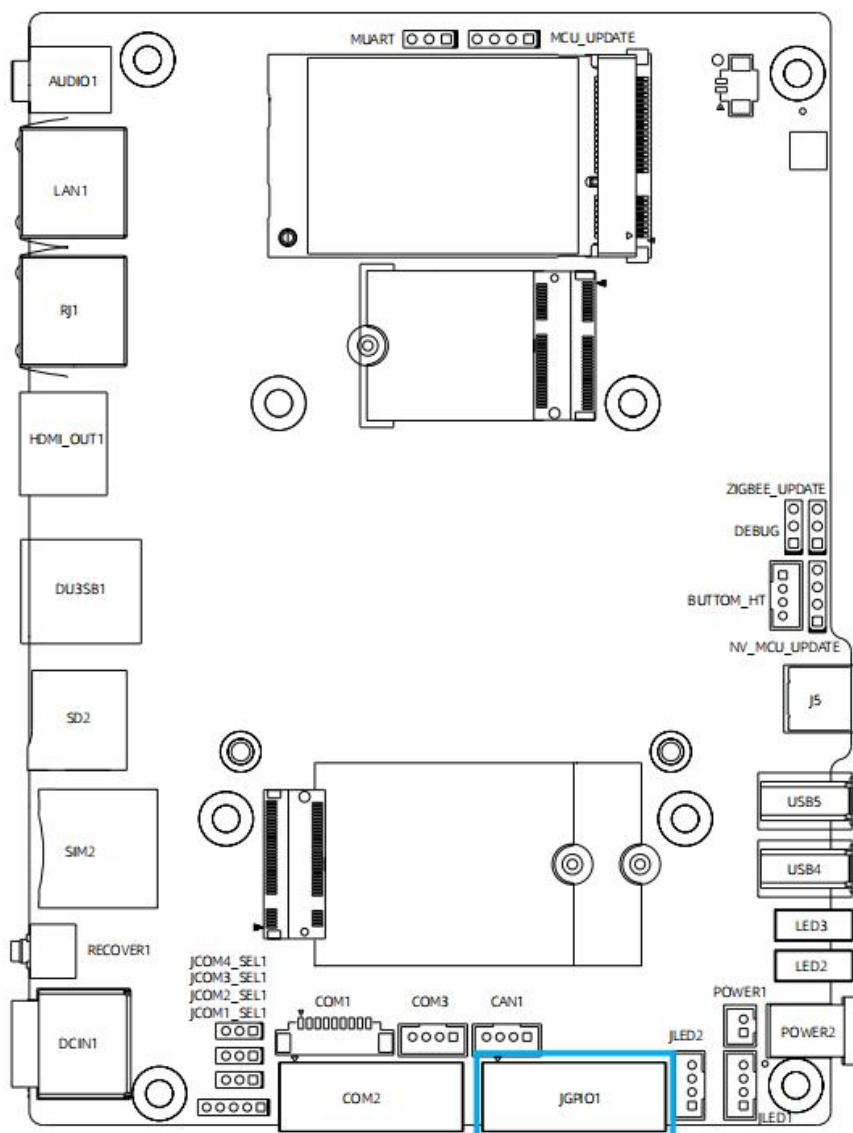
Pin	Definition
1	VCC4
2	TX
3	RX
4	GND

2.10 CAN1 pin interface



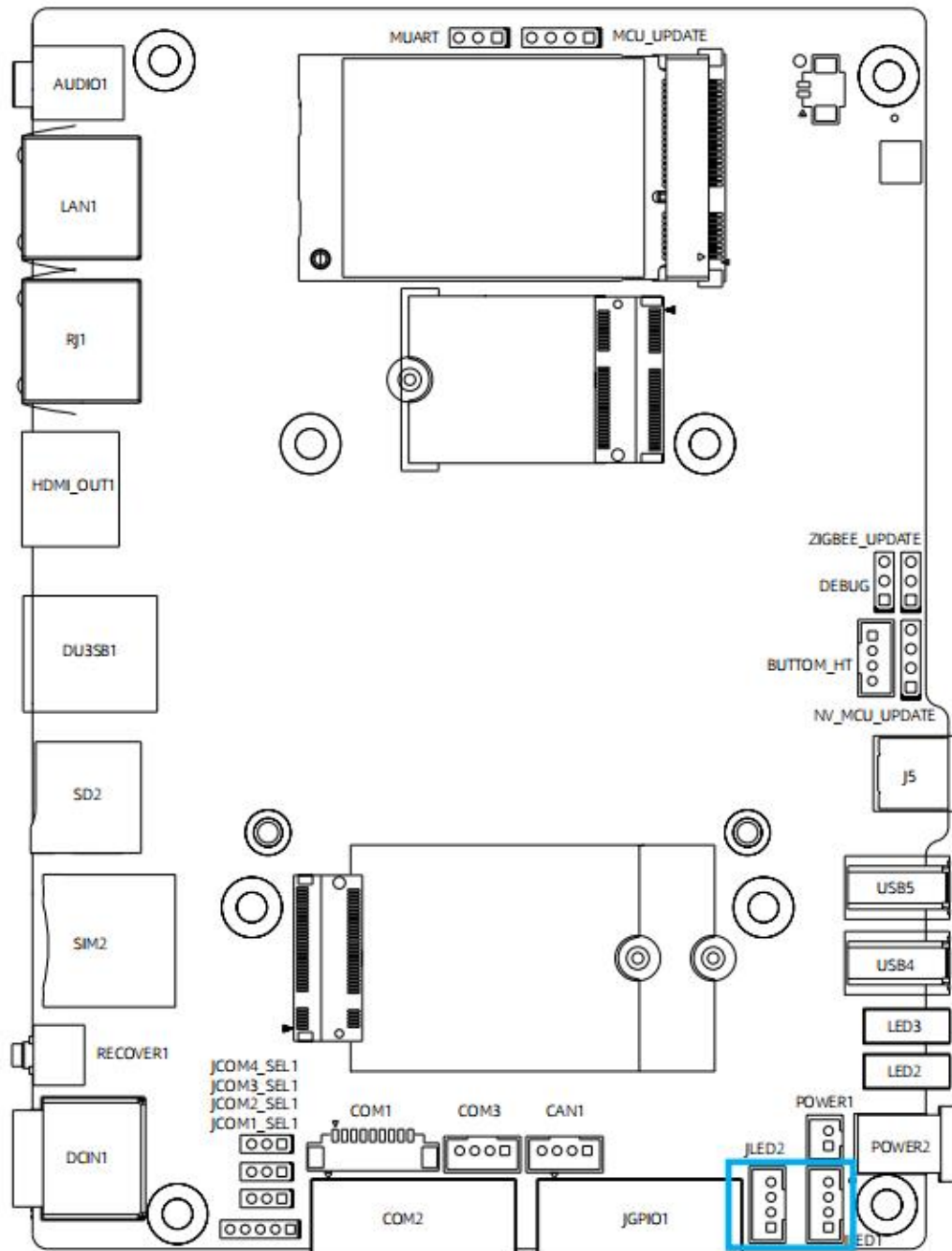
Pin	Definition
1	5V
2	CAN-H
3	CAN-L
4	GND

2.11 JGPIO1 pin interface



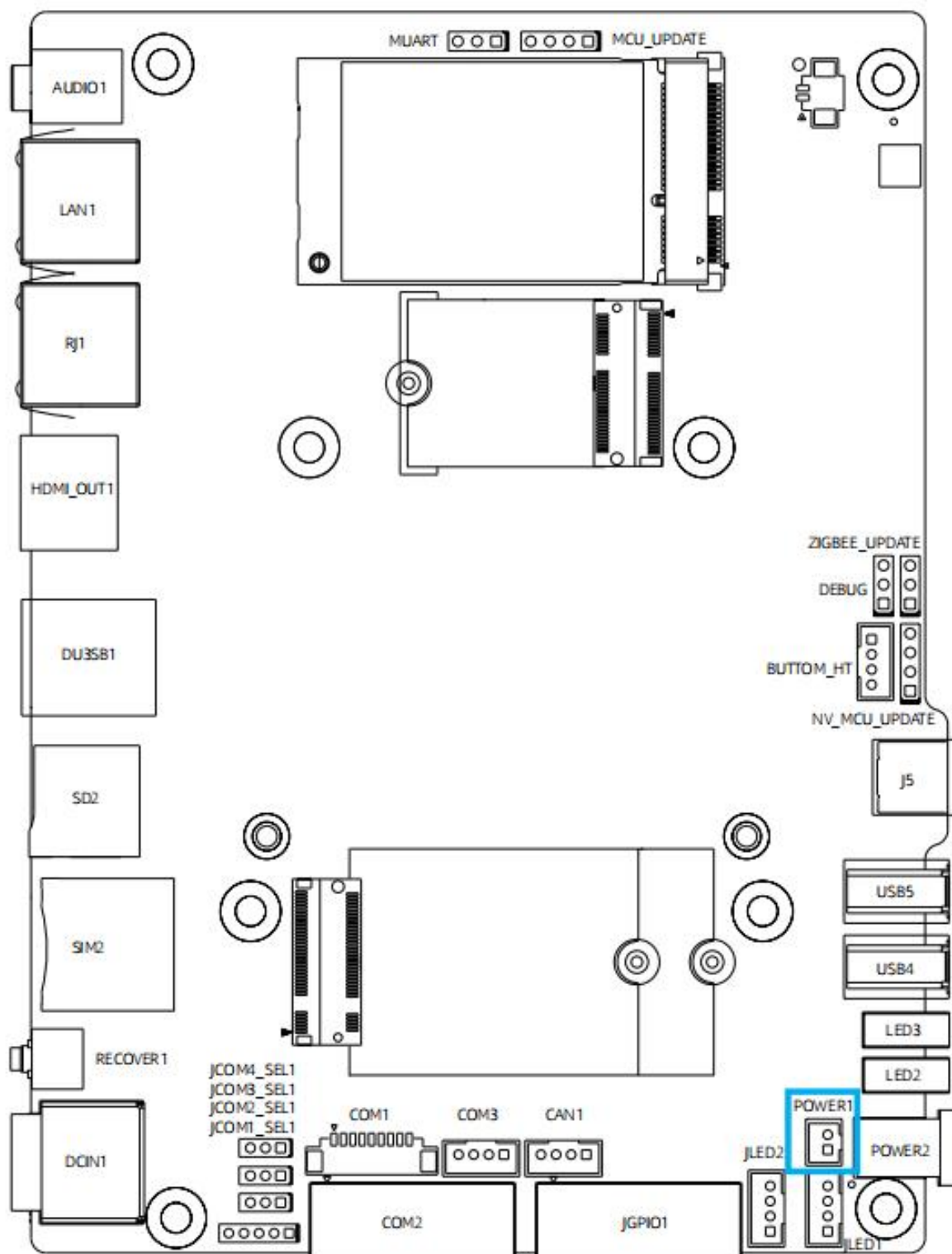
Pin	Definition
1	VCC
2	P0
3	P1
4	P2
5	P3
6	P4
7	P5
8	P6
9	P7
10	GND

2.12 JLED1/2 pin interface



JLED1 pin interface		JLED2 pin interface	
Pin	Definition	Pin	Definition
1	DC_LED+	1	WIFI_LED+
2	DC_LED-	2	WIFI_LED-
3	4G_LED+	3	ZIGBEE_LED+
4	4G_LED-	4	ZIGBEE_LED-

2.13 POWER1 pin interface



Pin	Definition
1	POWER_KEY
2	GND



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