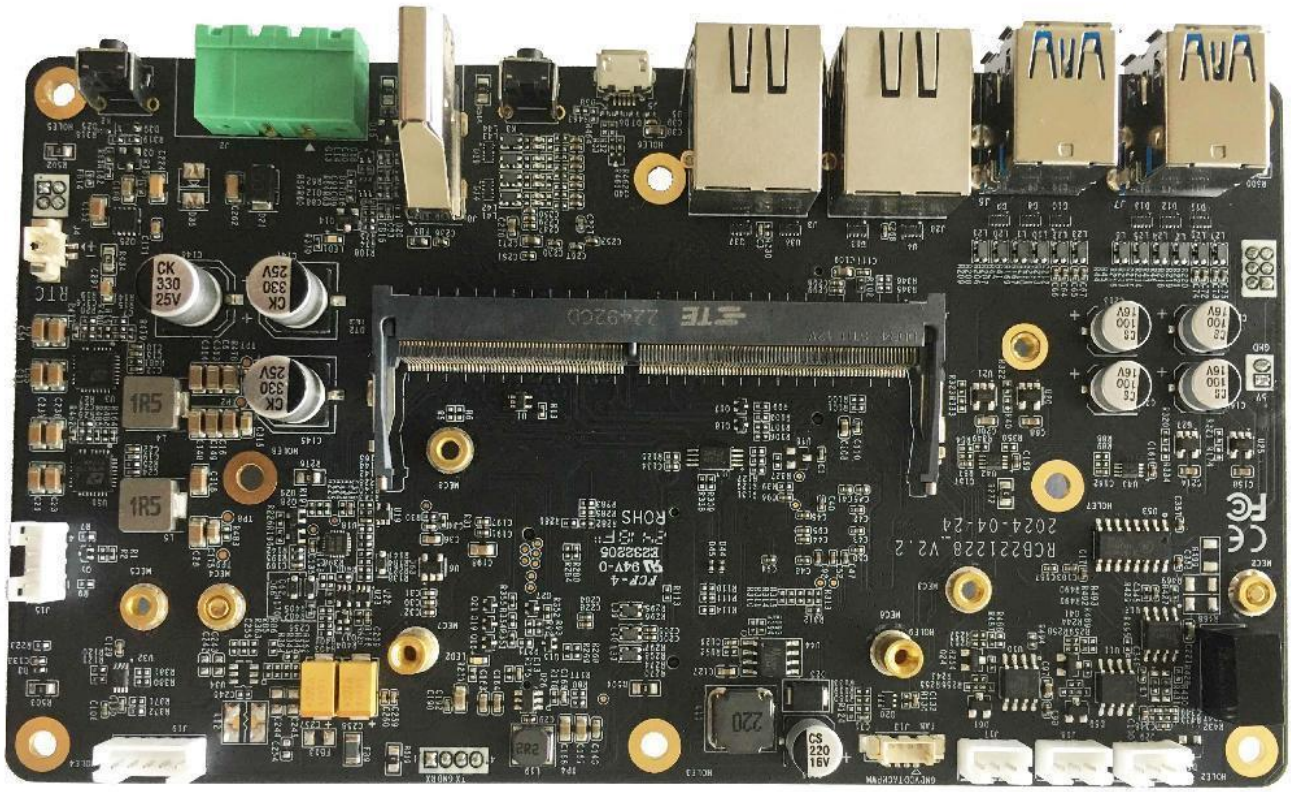
Nvidia AI Edge Computing

Carrier Board Specification

Model:NVJ101

For NVIDIA Jetson Orin NANO or NVIDIA Jetson Orin NX



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Confirmation

REVISION HISTORY					
VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V1.0	2024-7-1	RCB221228_V2.2	15	Specification	

APPROVED BY GENIATECH		
PREPARED BY 编写	**CHECKED BY 审核**	**APPROVED BY 批准**

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The terms HDMI, HDMI High-Definition Multimedia Interface, HDMI Trade dress and the HDMI Logos are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

1. General Description

NVIDIA AI Edge computing carrier NVJ101 is suitable for NVIDIA Jetson Orin Nano or NVIDIA Jetson Orin NX core module, NVIDIA Orin module gives up to 8 core Arm® Cortex®-A78AE v8.2 64 bit processor and 32 Tensor Core 1024 core NVIDIA Ampere architecture GPU, can provide AI performance of 40-100 TOPS. The NVIDIA Jetson Orin module is NVIDIA's latest high-performance, small-size, industrial-grade deep learning processor.

NVJ101 carrier board adopts high reliable, 70W load capacity power supply design, the input power supply has overvoltage and antipolarity protection, rich external interfaces, the whole plate devices choose industrial wide temperature specifications. Operating temperature-40℃ to + 85℃, low power consumption, high safety level, can meet the long time use in various harsh environments.

- NVIDIA Jetson Orin nano Core board

6 core ARM A78 Processor
512/1024-core NVIDIA Ampere architecture GPU with 16/32 Tensor Cores
4GB/8GB LPDDR5
34TOPS/67TOPS

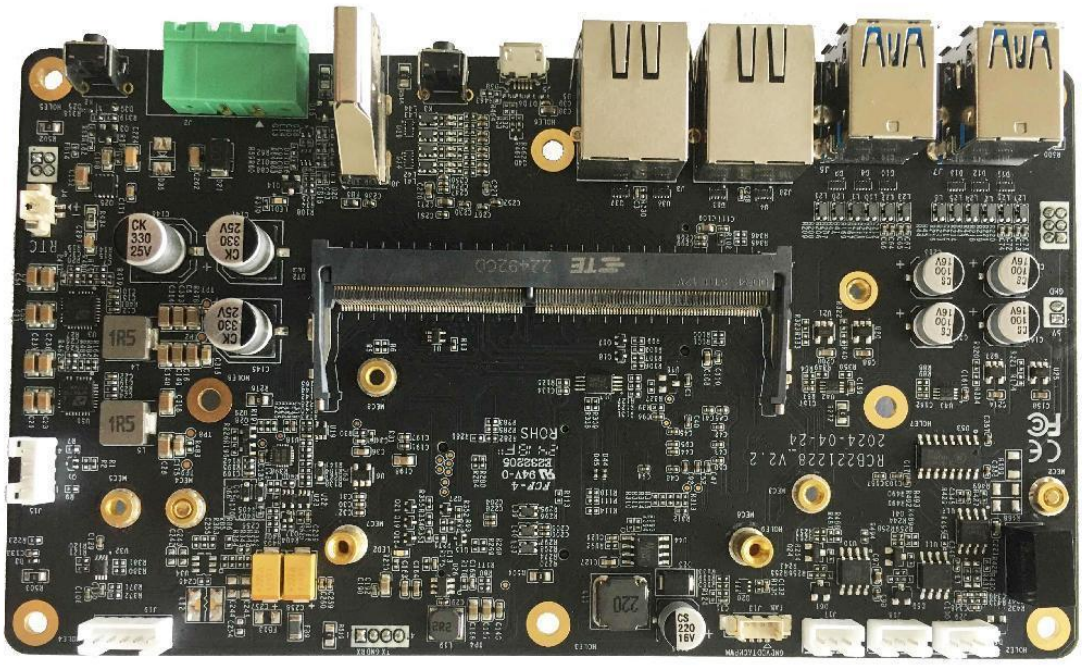
- NVIDIA Jetson Orin NX Core board

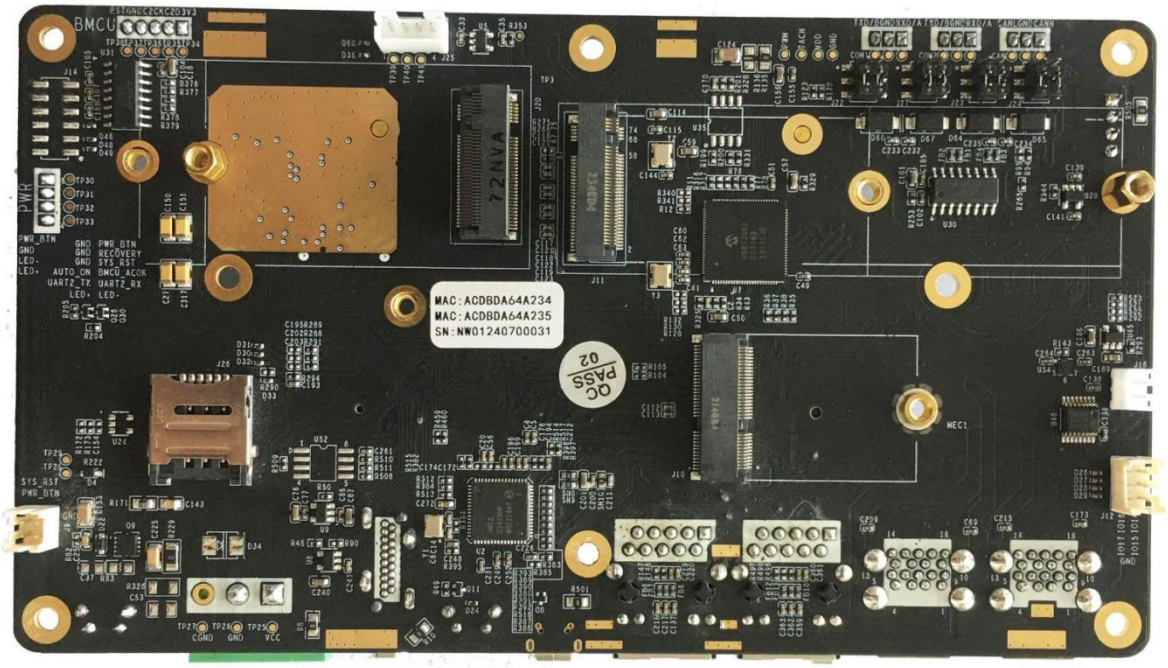
8 core ARM A78 Processor
1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores
8GB/16GB LPDDR5
117TOPS/157TOPS

- LAN*2+USB3.0*4+HDMI Out*1
- NVIDIA Open ecology and rich SDK
- 9--24V DC Power input

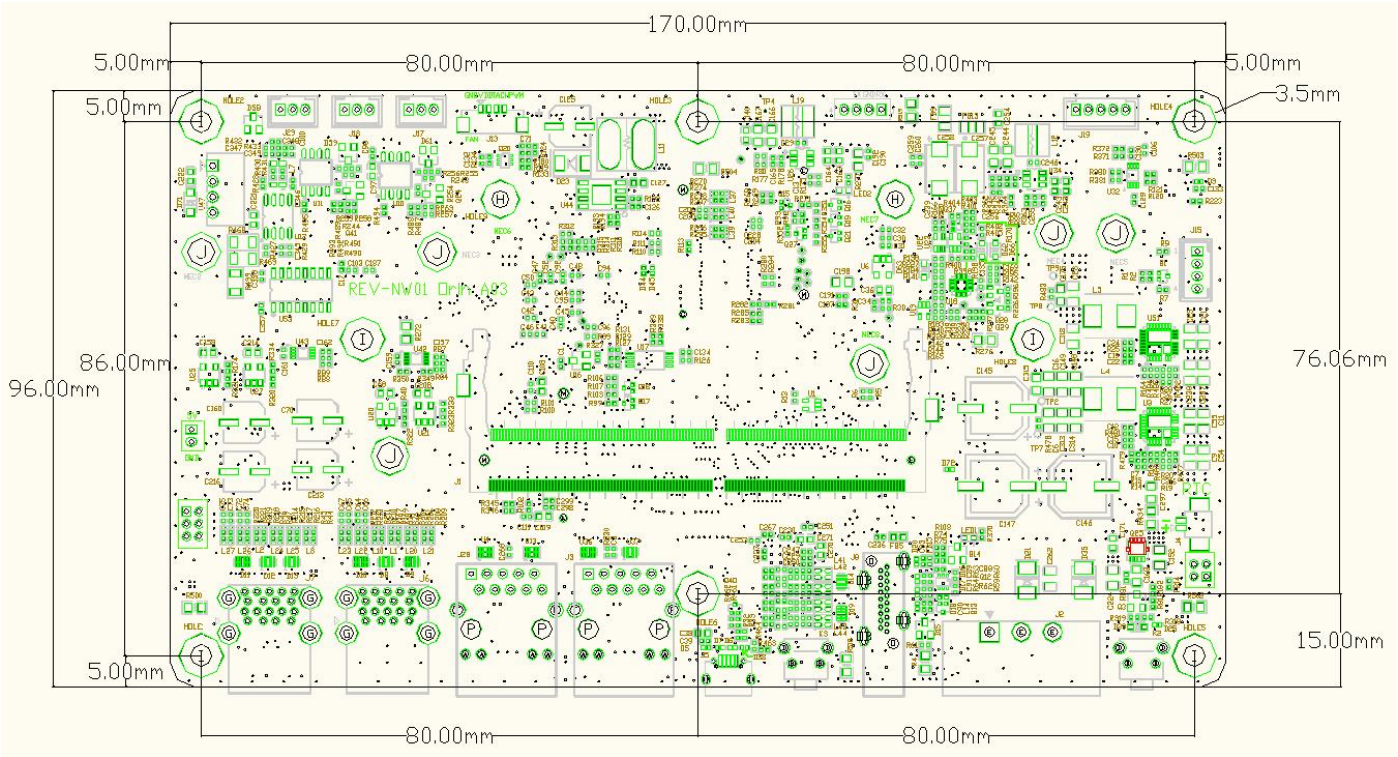
2. Product Pictures

Below pictures are for reference only:

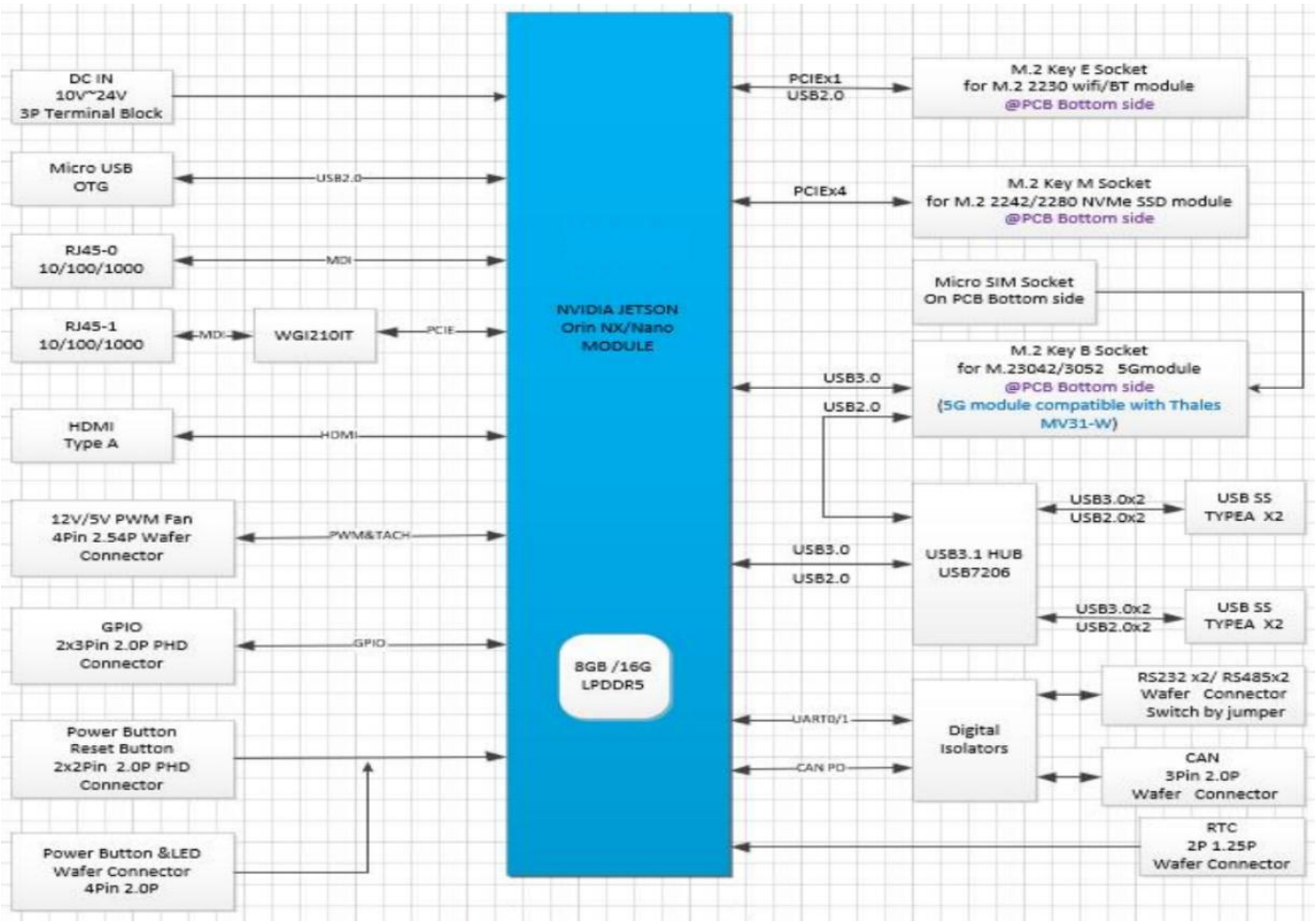



BMCU
MAC:ACDBDA64A234
MAC:ACDBDA64A235
SN:NW01240700031
QC PASS 02

3. Board View


170.00mm
5.00mm
80.00mm
80.00mm
5.00mm
3.5mm
5.00mm
86.00mm
96.00mm
76.06mm
15.00mm
5.00mm
80.00mm
80.00mm

4. Block Diagram

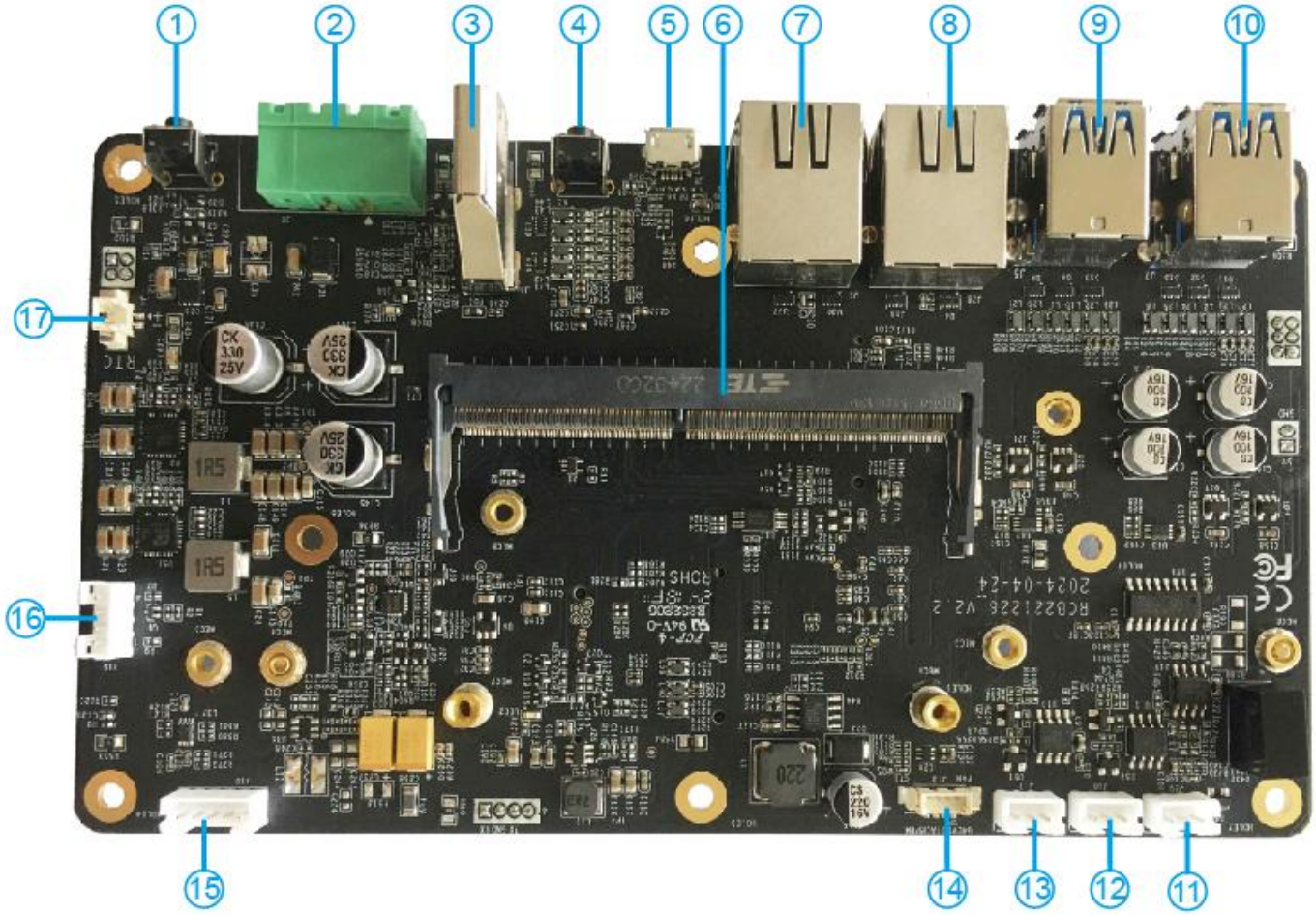


5.Features

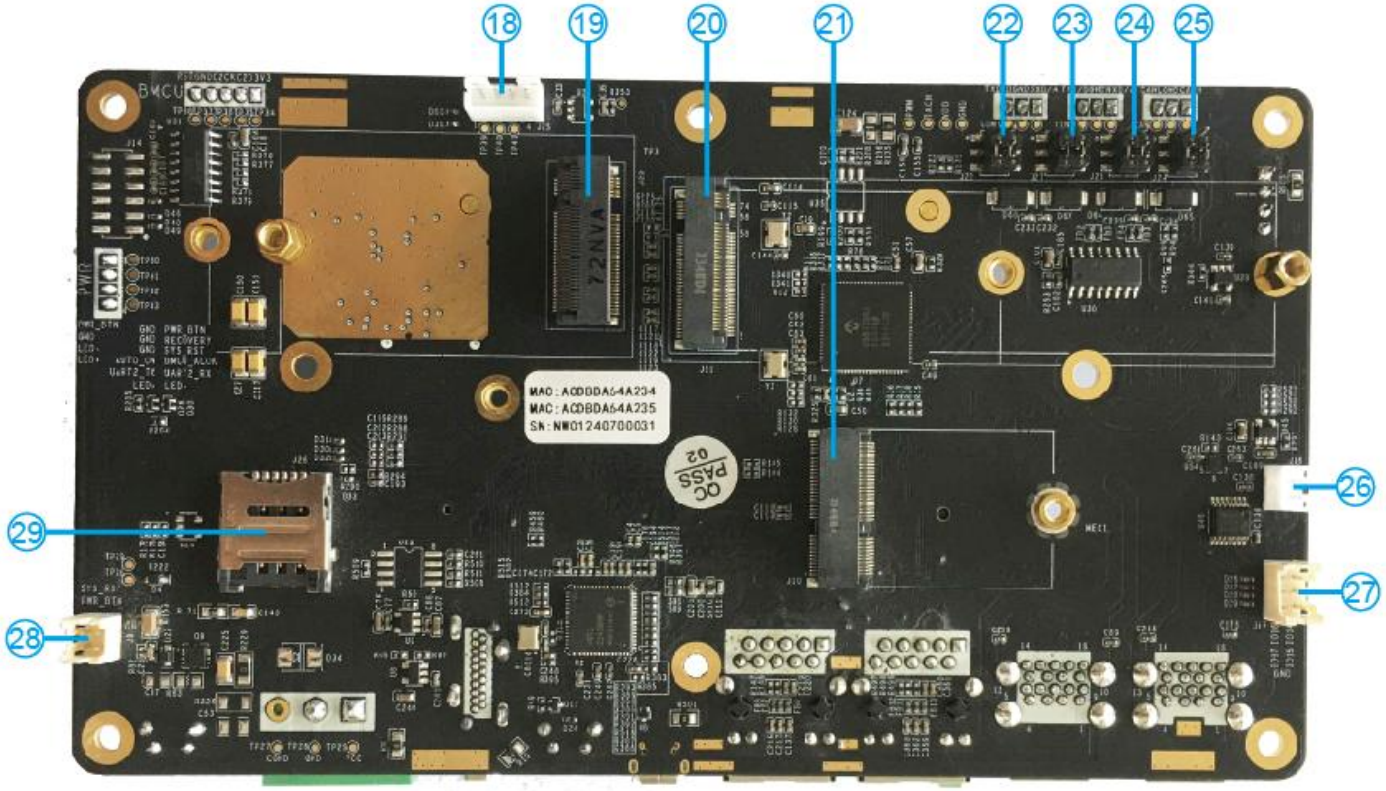
Model	NVJ101	
Core board model	NVIDIA® Jetson Orin Nano™	NVIDIA® Jetson Orin NX™
CPU	6- Core ARM Cortex A78AE v8.2 64 bit CPU (Max frequency: 1.7GHz)	8- Core ARM Cortex A78AE v8.2 64 bit CPU (Max frequency: 2.2GHz)
GPU	512/1024-core NVIDIA Ampere architecture GPU with 16/32 Tensor Cores(Max frequency:1020MHz)	1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores(Max frequency:1173MHz)
Menory	4GB LPDDR5 or 8GB LPDDR5	8GB LPDDR5 or 16GB LPDDR5
Storage	NVMe via M.2 Key M	NVMe via M.2 Key M
AI Performance	34/67 TOPS	117/157 TOPS
Video Encode	1080p @30 supported via CPU cores with software	1x 4K60 (H.265) 3x 4K30 (H.265) 6x 1080p60 (H.265) 12x 1080p30 (H.265)
Video Decode	1x 4K @ 60 (H.265) 2x 4K @ 30 (H.265) 5x 1080p @ 60 (H.265) 11x 1080p @ 30 (H.265)	1x 8K30 (H.265) 2x 4K60 (H.265) 4x 4K30 (H.265) 9x 1080p60 (H.265) 18x 1080p30 (H.265)
Network	2xGbE RJ-45	
	WiFi(Optional)	
	4G LTE/5G (Optional)	
Display Output	HDMI 1.4 4K@30Hz	
USB	1x MicroUSB2.0 4xUSB3.0 type-A	
SIM Card	1xMicro SIM card slot	
Key	1xRecovery key 1xReset key	
Power Input	9V~24V	
power dissipation	7-15w	
Other Interface	3 x M.2	
	RTC -- RTC battery life monitoring is supported via the MCU	
	2 x RS232/RS485	
	1 x CAN	
	4 x GPIO	
	1 x Fan power supply	
	1 x DC Out（+5V）	
Size(mm)	170x96	

6. Extension I/O definition

Description of carrier board NVJ101 I/O - PORTS



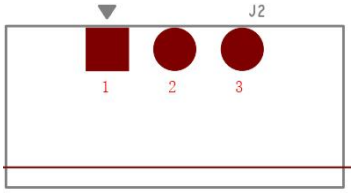
Pin No	Symbol	Function		Pin No	Symbol	Function
1	K2	Reset		10	J7	USB3.0*2
2	J2	DC Input		11	J29	CAN
3	J8	HDMI Out		12	J18	COM1 (RS232 or RS485)
4	K3	Recovery		13	J17	COM0 (RS232 or RS485)
5	J5	MicroUSB		14	J13	CPU FAN
6	J1	SODIMM260_JETSON_Orin_NANO		15	J19	BMCU
7	J3	LAN GbE RJ-45		16	J15	PWR Button and PWR LED
8	J28	LAN GbE RJ-45		17	J4	RTC Battery
9	J6	USB3.0*2				



Pin No	Symbol	Function		Pin No	Symbol	Function
18	J25	UART Debug		24	J23	COM1 interface RS232 or RS485 option
19	J20	M.2 KEY B		25	J24	UART1 Connects to COM1-RS232/RS485 option
20	J11	M.2 KEY-M (NVME)		26	J16	DC Out +5V
21	J10	M.2 KEY-E (WIFI/BT)		27	J12	GPIO extended interface
22	J22	COM0 interface RS232 or RS485 option		28	J9	Automation Pin
23	J27	UART0 Connects to COM0-RS232/RS485 option		29	J29	Micro SIM_CARD

6.1 Power Supply Input Interface(J2)

Provides power supply input interface, using a 5.08 pitch 2P Phoenix terminal connector



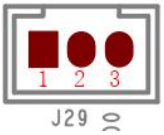
Power supply input interface diagram

6.1.1 Pin definition

Label	Pin	Function	Name	Comments
J2	1	Input power supply（DC 9V--24V）	VCC	
	2	Power ground signal	GND	
	3	NC	CGND	

6.2 CAN Interface(J29)

Provides one CAN port, connected to 2.0 pitch 3Pin port. convenient for users to evaluate related functions.



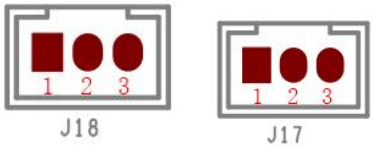
CAN interface diagram

6.2.1 Pin definition

Label	Pin	Function	Name	Comments
J29	1	CAN_H	CAN_H	
	2	Ground signal	GND	
	3	CAN_L	CAN_L	

6.3 COM Interface(J18，J17)

Provides two COM port, connected to 2.0 pitch 3Pin port. convenient for users to evaluate related functions.



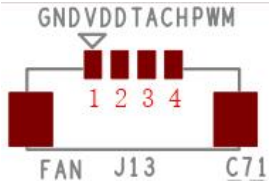
COM interface diagram

6.3.1 Pin definition

Label	Pin	Function	Name	Comments
J17	1	COM0 interface（RS232-RX or RS485 A+）	COM0-RXD/A	
	2	Ground signal	GND	
	3	COM0 interface（RS232-TX or RS485 B-）	COM0-TXD/B	
J18	1	COM1 interface（RS232-RX or RS485 A+）	COM1-RXD/A	
	2	Ground signal	GND	
	3	COM1 interface（RS232-TX or RS485 B-）	COM1-TXD/B	

6.4 CPU FAN Interface(J13)

Provides one CPU FAN port, connected to 1.25 pitch 4Pin port. convenient for users to evaluate related functions.



CPU FAN interface diagram

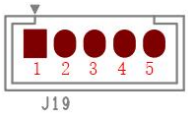
6.4.1 Pin definition

Label	Pin	Function	Name	Comments
J13	1	Ground signal	GND	

	2	+12V Power supply	VCC	
	3	Fan speed measurement,monitor the fan speed	FAN_TACH_CON	
	4	Fan speed regulation	FAN_PWM_Q	

6.5 BMCU Interface(J19)

Provides one BMCU port, connected to 2.0 pitch 5Pin port. convenient for users to evaluate related functions.



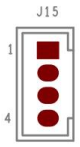
BMCU interface diagram

6.5.1 Pin definition

Label	Pin	Function	Name	Comments
J19	1	3.3V power supply	3V3_AO	
	2	BMCU data signal	BMCU_C2D	
	3	BMCU clock signal	BMCU_C2CK	
	4	Ground signal	GND	
	5	BMCU reset signal	BMCU_nRST	

6.6 Power Button And Indicator Light Interface(J15)

Provides power button and indicator light port, connected to 2.0 pitch 4Pin port. convenient for users to evaluate related functions.



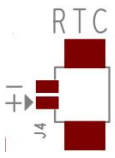
Power button and indicator light interface diagram

6.6.1 Pin definition

Label	Pin	Function	Name	Comments
J15	1	Power button	PWR_BTN_N	
	2	Ground signal	GND	
	3	Power supply indicator -	PWR_LED-	
	4	Power supply indicator +	PWR_LED+	

6.7 RTC Battery Interface(J4)

Provides RTC battery port, connected to 1.25 pitch 2Pin port. convenient for users to evaluate related functions.



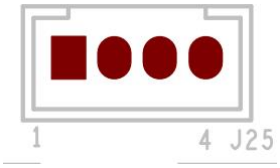
RTC battery interface diagram

6.7.1 Pin definition

Label	Pin	Function	Name	Comments
J4	1	RTC battery negative	BAT_CONN	
	2	RTC battery positive	GND	

6.8 Debug Interface(J25)

Provides debug port, connected to 2.0 pitch 4Pin port. convenient for users to evaluate related functions.



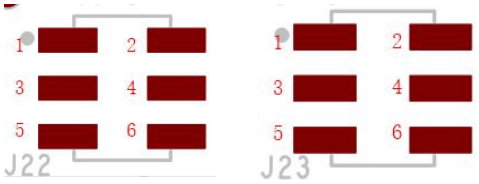
Debug Interface diagram

6.8.1 Pin definition

Label	Pin	Function	Name	Comments
J25	1	Debug receive data	RX	
	2	Ground signal	GND	
	3	Debug transmit data	TX	
	4	NC	VCC	

6.9 COM Function Selection Interface(J22，J23)

Provides two COM function selection interface, can be in RS232 and RS485 two function selection, use 2.0 pitch double row 3P row seat.

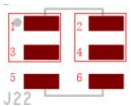
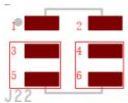
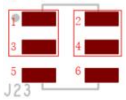
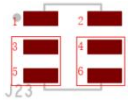


COM Function interface diagram

6.9.1 Pin definition

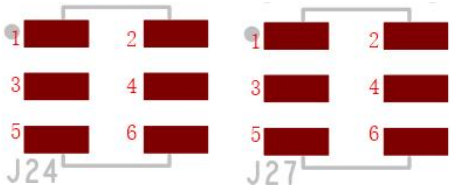
Label	Pin	Function	Name	Comments
J22	1	RS485-0-B	RS485-0_B	
	2	RS485-0-A	RS485-0_A	
	3	COM0 transmit data or RS485-B	COM0-TXD/B	
	4	Com0 receive data or RS485-A	COM0-RXD/A	
	5	RS232-0 transmit data	RS232-0-TX	
	6	RS232-0 receive data	RS232-0-RX	
23	1	RS485-1-B	RS485-1_B	
	2	RS485-1-A	RS485-1_A	
	3	COM1 transmit data or RS485-B	COM1-TXD/B	
	4	COM1 receive data or RS485-A	COM1-RXD/A	

	5	RS232-1 transmit data	RS232-1-TX	
	6	RS232-1 receive data	RS232-1-RX	

Function Selection Settings	Function
	COM0 functions as RS485
	COM0 functions as RS232
	COM1 functions as RS485
	COM1 functions as RS232

6.10 UART Function Interface(J24，J27)

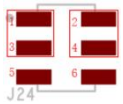
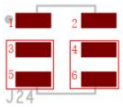
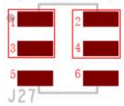
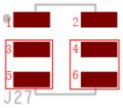
Provides two UART function selection interface, can be in the RS232 and RS485 two function selection, using 2.0 pitch double row 3P row seat



UART Function Interface diagram

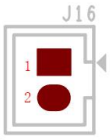
6.10.1 Pin definition

Label	Pin	Function	Name	Comments
J24	1	UART1 connected RS485-B conversion circuit	UART1_TX_485	
	2	UART1 connected RS485-A conversion circuit	UART1_RX_485	
	3	UART1 connected RS232 transmit data or RS485-B conversion circuit	UART1_TXD232_485	
	4	UART1 connected RS232 receive data or RS485-A conversion circuit	UART1_RXD232_485	
	5	UART1 connected RS232 transmit data	UART1_TX_232	
	6	UART1 connected RS232 receive data	UART1_RX_232	
J27	1	UART0 connected RS485-B conversion circuit	UART0_TX_485	
	2	UART0 connected RS485-A conversion circuit	UART0_RX_485	
	3	UART0 connected RS232 transmit data or RS485-B conversion circuit	UART0_TXD232_485	
	4	UART0 connected RS232 receive data or RS485-A conversion circuit	UART0_RXD232_485	
	5	UART0 connected RS232 transmit data	UART0_TX_232	
	6	UART0 connected RS232 receive data	UART0_RX_232	

Function Selection Settings	Function
	UART1 connected RS485 conversion circuit
	UART1 connected RS232 conversion circuit
	UART0 connected RS485 conversion circuit
	UART0 connected RS232 conversion circuit

6.11 DC +5V Power Supply Output Interface(J16)

Provides DC+5V power output connector, using 2.0 pitch 2P white chassis connector



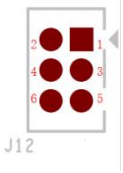
DC +5V power supply output interface diagram

6.11.1 Pin definition

Label	Pin	Function	Name	Comments
J16	1	DC 5V power supply output	DC 5V	
	2	Ground signal	GND	

6.12 GPIO Interface(J12)

Provide 4 GPIO interface, using 2.0 spacing double 3P seats



GPIO interface diagram

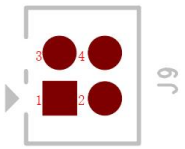
6.12.1 Pin definition

Label	Pin	Function	Name	Comments
J12	1	General I/O 14 interface	GPIO14_EXT	
	2	General I/O 16 interface	GPIO16_EXT	
	3	General I/O 15 interface	GPIO15_EXT	
	4	General I/O 17 interface	GPIO17_EXT	
	5	Ground signal	GND	

	6	Ground signal	GND	

6.13 System Switch Reboot Button Interface(J9)

The system switch and restart interface are provided, using 2.0 spacing double row 2P row seats



System switch reboot button interface diagram

6.13.1 Pin definition

Label	Pin	Function	Name	Comments
J9	1	Power button interface	PWR_BTN_N	
	2	Ground signal	GND	
	3	System reboot button interface	SYS_RST_N	
	4	Ground signal	GND	

7.Precautions For Use

1. Do not squeeze、distort or disassemble the board.
2. Keep the board away from static electricity .
3. Keep the board away from water and other liquid.
4. Clean the board with soft and clean dry cloth when it’s dirty.
5. Don’t use long connect wires which may affect performance and image quality.

More Help

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Official Website：www.geniatech.com
Official Mall：https://shop.geniatech.com