



AI Development Carrier Board

Y-C13

Datasheet



Version V1.2

Date 2026-01-19

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Y-C13 Document History

Version	Date	Description of Change	Hardware Version
V 1.0	2023-8-31	Create Document	V 1.0
V 1.1	2025-01-08	Modify the font	V 1.0
V 1.2	2026-01-19	Modify Dimension Figure	V 1.0

Hardware Update History

Version	Date	Description of Change
V 1.0	2022-8-31	Initial version



Electronic components and circuits are very sensitive to electrostatic discharge, although the company will design the main interface on the board card to do anti-static protection design, but it is difficult to do anti-static safety protection for all components and circuits. Therefore, it is recommended that you take ESD safety measures when handling any circuit board component.

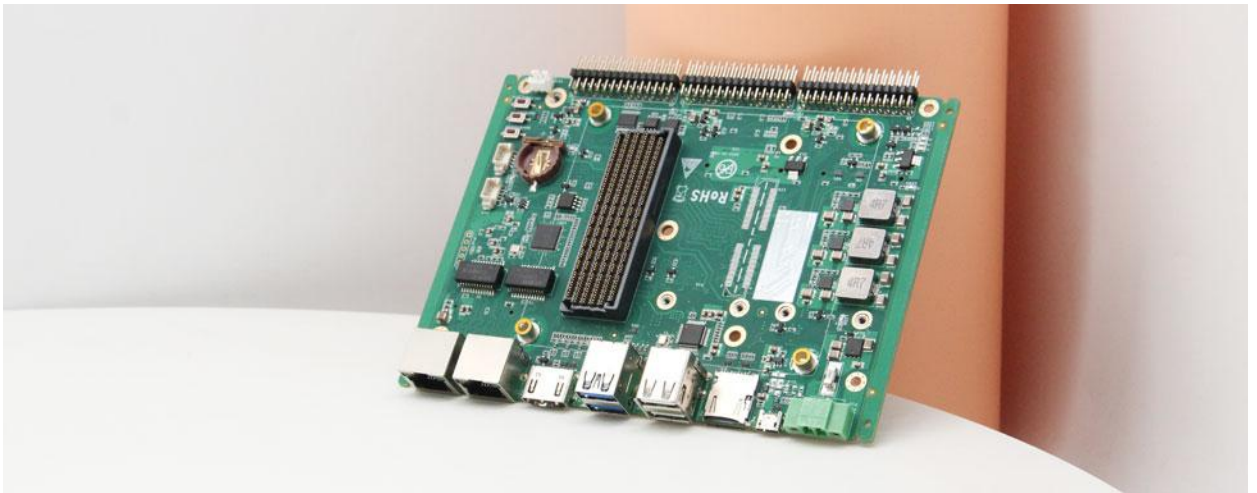
ESD safety measures include but are not limited to the following:

1. Put the card in an ESD bag during transportation or storage. Do not take out the card until installation and deployment.
2. Before touching the board, release the static electricity stored in the body: Wear a grounding wrist strap.
3. Operate circuit boards only in electrostatic discharge safe areas.
4. Avoid moving circuit boards in carpeted areas.
5. Avoid direct contact with electronic components on the board through edge contact.

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1 Introduction



The Y-C13 AI development board (hereinafter referred to as Y-C13) is a high-performance AI carrier board that is compatible with the NVIDIA Jetson AGX Xavier/AGX ORIN core module. It can provide up to 275 TOPS of computing power and is widely used in education, robotics, unmanned aerial vehicles, industrial automation, smart cities and other scenarios.

All the board-level components are of wide-temperature industrial-grade models. The main interfaces have been designed with electrostatic safety protection. A highly reliable power application scheme has been adopted. The input power has overvoltage and reverse polarity protection functions, and it has a rich set of external interfaces. It can be equipped with hundreds of functional modules to further expand the system functions. The carrier board has a Nano SIM card slot and supports 4G functionality.

2 Specifications

	Feature
Y-C13	Carrier Board
Module	NVIDIA Jetson AGX Orin /AGX Xavier Core Module
Temperature	-40 ~ +85°C
Dimensions (W×H×D)	147mm*115mm*26.6mm (L/W Not Including I/O ports and mounting holes)
Weight	140g

Power Supply	Spec
Input Type	DC
Input Voltage	+12V

I/O Ports

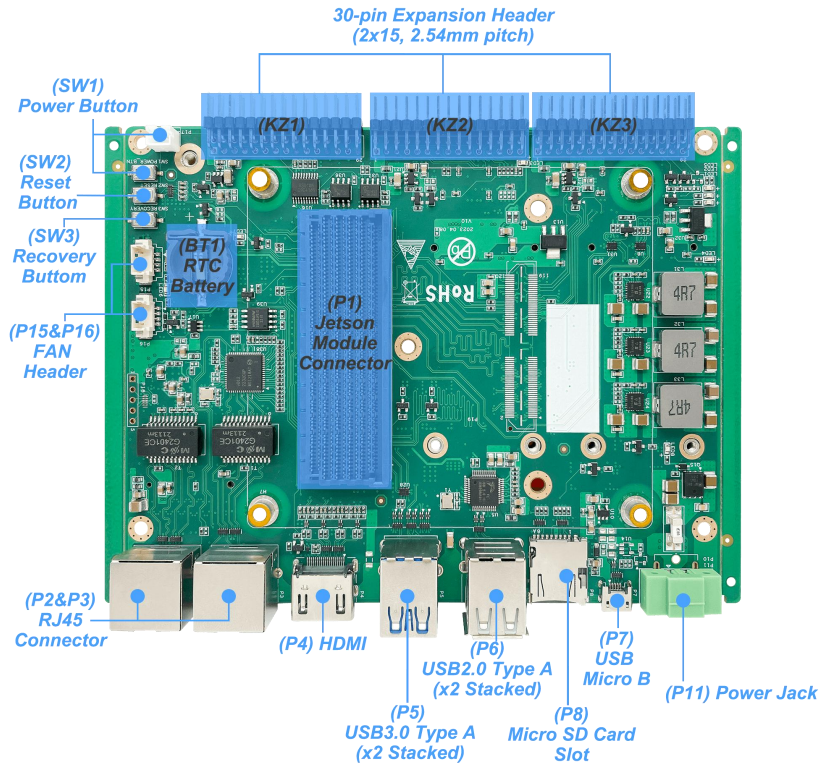
Interface	Quantity	Interface	Quantity
USB3.0 Type-A	4	Micro USB	1
RJ45	2	HDMI	1
MiniPCIe	2	Nano SIM Card Slot	1
M.2 M key 2280	1	RTC Battery	1
30pin(2x15) 2.54mm Spacing multi-functional extended pin connector	1(Include 9xGPIO, 3xI2C, 1xSPI, 1xI2S, 3xUART...)		

NVIDIA Jetson Series

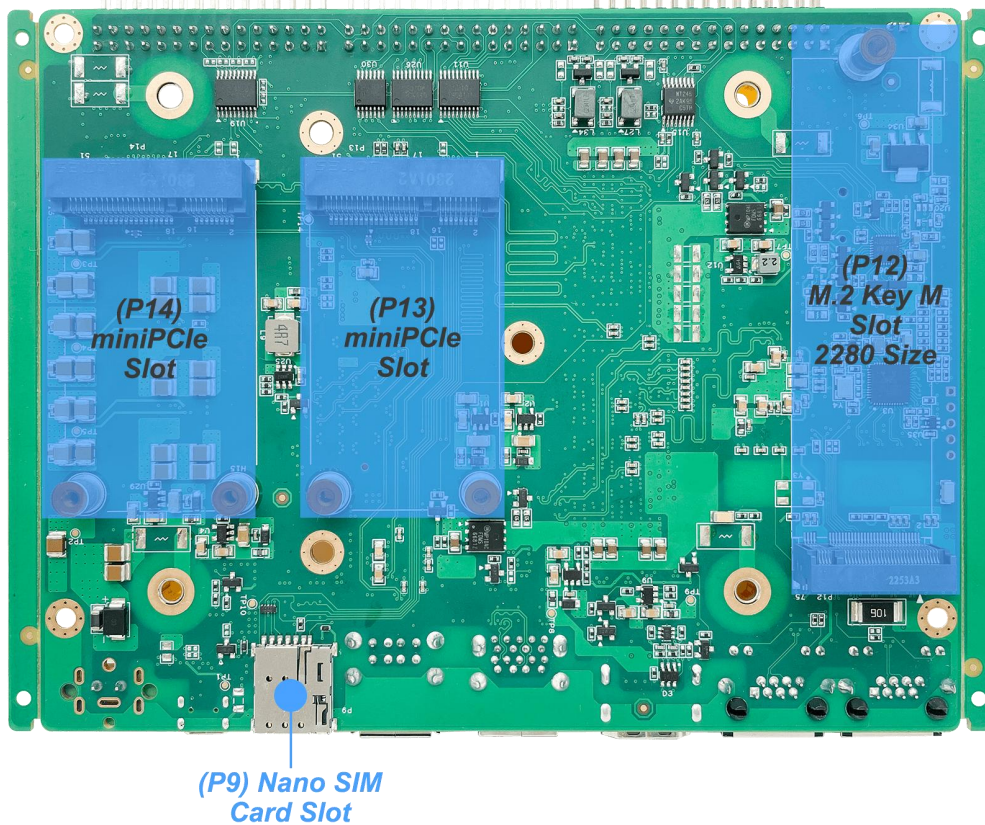
Modules Technical Specifications

Module	Jetson AGX Xavier 32GB	Jetson AGX Xavier 64GB	Jetson AGX Orin 32GB	Jetson AGX Orin 64GB
AI Performance	32TOPS		200 TOPS	275 TOPS
GPU	512-core NVIDIA Ampere architecture GPU with 64 Tensor Cores		1792-core NVIDIA Ampere architecture GPU with 56 Tensor Cores	2048-core NVIDIA Ampere architecture GPU with 64 Tensor Cores
CPU	8-core NVIDIA Carmel Arm® v8.2 64-bit CPU 8MB L2 + 4MB L3		8-core Arm® Cortex®-A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3	12-core Arm® Cortex®-A78AE v8.2 64-bit CPU 3MB L2 + 6MB L3
Memory	32GB 256-bit LPDDR4x 136.5GB/s	64GB 256-bit LPDDR4x 136.5GB/s	32GB 256-bit LPDDR5 204.8 GB/s	64GB 256-bit LPDDR5 204.8 GB/s
Storage	32GB eMMC 5.1		64GB eMMC 5.1	
Video Encode	4x 4K60 (H.265) 8x 4K30 (H.265) 16x 1080p60 (H.265) 32x 1080p30 (H.265)		1x 4K60 (H.265) 3x 4K30 (H.265) 6x 1080p60 (H.265) 12x 1080p30 (H.265)	2x 4K60 (H.265) 4x 4K30 (H.265) 8x 1080p60 (H.265) 16x 1080p30 (H.265)
Video Decode	2x 8K30 (H.265) 6x 4K60 (H.265) 12x 4K30 (H.265) 26x 1080p60 (H.265) 52x 1080p30 (H.265)		1x 8K30 (H.265) 2x 4K60 (H.265) 4x 4K30 (H.265) 9x 1080p60 (H.265) 18x 1080p30 (H.265)	1x 8K30 (H.265) 3x 4K60 (H.265) 7x 4K30 (H.265) 11x 1080p60 (H.265) 22x 1080p30 (H.265)
Power	10W - 30W		15W - 40W	15W - 60W

3 External I/O Ports



Sign	Function	Sign	Function
P1	Jetson Module Connector		
P5/P6	Double-layer Type A USB 3.0 connector	P2/P3	RJ45 Jack(10/100/1000Mbps ethernet)
P4	Type A HDMI Connector	P11	Power Jack
P8	Micro SD Card Slot	P7	USB Micro B
BT1	CR1220 Battery Header	KZ1/KZ2/KZ3	30-pin Expand the functional interface
SW1/P17	POWER Button	SW2	RESET Button
SW3	RECOVERY Button	P15/P16	5V Fan Header

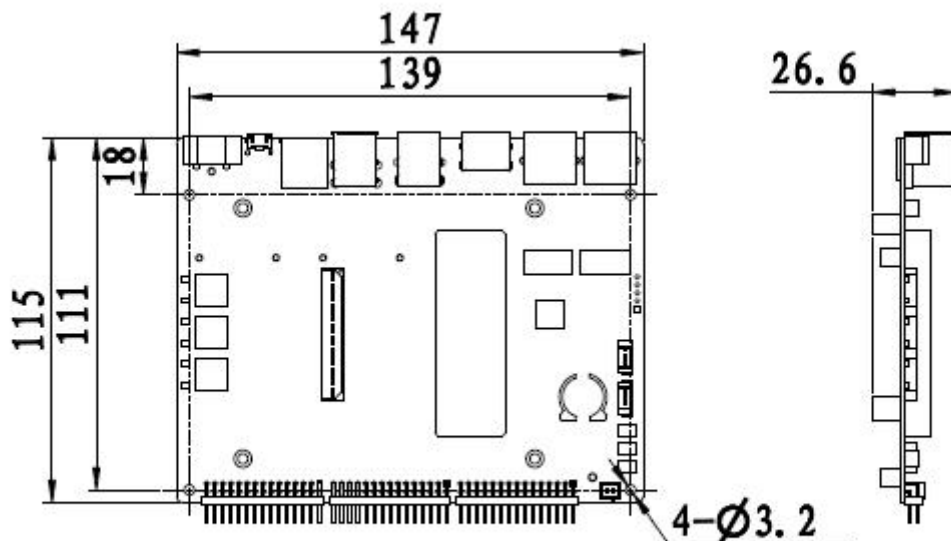
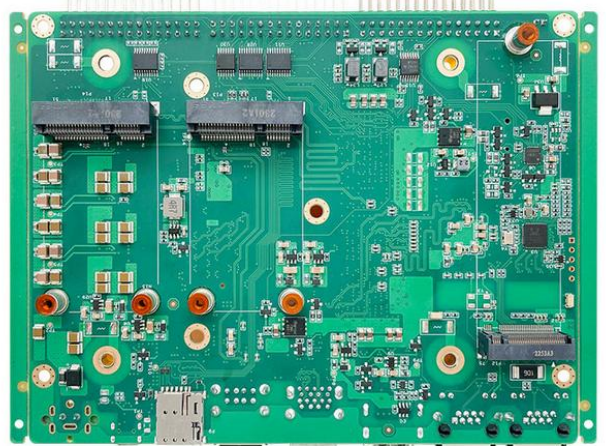
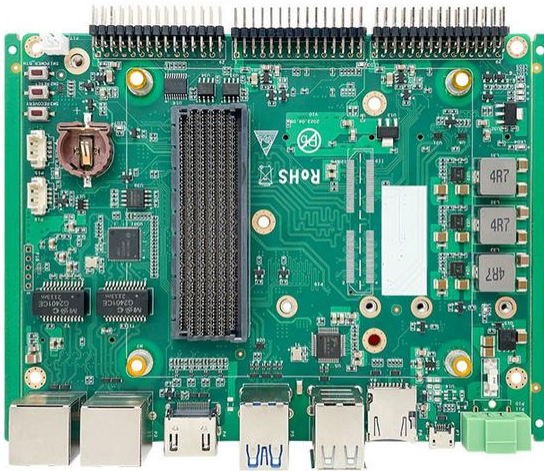


Sign	Function	Sign	Function
P13/P14	miniPCle Slot	P9	Nano SIM Card Slot
P12	M.2 Key M Slot(Size 2280)		

LED Indicator Light

Sign	Function
LED7	Core module working status indicator light
LED1/LED2	Power status indicator light for the carrier board
LED5	m.2 indicator light

4 Dimension Figure



5 Y-C13 Connector Description

Jetson Module Connector (P1)		
Function	Connect NVIDIA Jetson AGX Orin / AGX Xavier Series Modules	
Sign	P1	
Type/Model	699-pin SO-DIMM	
Pin definition	For pin definitions of this connector, refer to the pin definition instructions in the NVIDIA Jetson AGX ORIN / AGX Xavier series module datasheet.	

RJ45 Jack (P2&P3)																									
Function	10/100/1000Mbps Ethernet																								
Sign	P2&P3																								
Type/Model	RJ45 ethernet socket																								
Pin definition	<table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>TX_D1+</td><td>2</td><td>TX_D1-</td></tr><tr><td>3</td><td>RX_D2+</td><td>4</td><td>BI_D3+</td></tr><tr><td>5</td><td>BI_D3-</td><td>6</td><td>RX_D2-</td></tr><tr><td>7</td><td>BI_D4+</td><td>8</td><td>BI_D4-</td></tr></table>					Pin	Signal	Pin	Signal	1	TX_D1+	2	TX_D1-	3	RX_D2+	4	BI_D3+	5	BI_D3-	6	RX_D2-	7	BI_D4+	8	BI_D4-
Pin	Signal	Pin	Signal																						
1	TX_D1+	2	TX_D1-																						
3	RX_D2+	4	BI_D3+																						
5	BI_D3-	6	RX_D2-																						
7	BI_D4+	8	BI_D4-																						

HDMI Connector (P4)																																																
Function	HDMI Connector																																															
Sign	P4																																															
Type/Model	Standard Type A HDMI Connector																																															
Pin definition	<table><thead><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr></thead><tbody><tr><td>1</td><td>TXD2_P</td><td>2</td><td>D2_SHIELD</td></tr><tr><td>3</td><td>TXD2_N</td><td>4</td><td>TXD1_P</td></tr><tr><td>5</td><td>D1_SHIELD</td><td>6</td><td>TXD1_N</td></tr><tr><td>7</td><td>TXD0_P</td><td>8</td><td>D0_SHIELD</td></tr><tr><td>9</td><td>TXD0_N</td><td>10</td><td>TXCK_P</td></tr><tr><td>11</td><td>CK_SHIELD</td><td>12</td><td>TXCK_N</td></tr><tr><td>13</td><td>CEC</td><td>14</td><td>RESERVED</td></tr><tr><td>15</td><td>SCL</td><td>16</td><td>SDA</td></tr><tr><td>17</td><td>DDC/CEC_GND</td><td>18</td><td>+5V</td></tr><tr><td>19</td><td>HP_DET</td><td></td><td></td></tr></tbody></table>				Pin	Signal	Pin	Signal	1	TXD2_P	2	D2_SHIELD	3	TXD2_N	4	TXD1_P	5	D1_SHIELD	6	TXD1_N	7	TXD0_P	8	D0_SHIELD	9	TXD0_N	10	TXCK_P	11	CK_SHIELD	12	TXCK_N	13	CEC	14	RESERVED	15	SCL	16	SDA	17	DDC/CEC_GND	18	+5V	19	HP_DET		
	Pin	Signal	Pin	Signal																																												
	1	TXD2_P	2	D2_SHIELD																																												
	3	TXD2_N	4	TXD1_P																																												
	5	D1_SHIELD	6	TXD1_N																																												
	7	TXD0_P	8	D0_SHIELD																																												
	9	TXD0_N	10	TXCK_P																																												
	11	CK_SHIELD	12	TXCK_N																																												
	13	CEC	14	RESERVED																																												
	15	SCL	16	SDA																																												
	17	DDC/CEC_GND	18	+5V																																												
	19	HP_DET																																														

Fan Header (P15/P16)																	
Function	Connect to external cooling system																
Sign	P15/P16																
Type/Model	A1251WV-S-4P(1.25mm) needle file																
Pin definition	<table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>GND</td><td>2</td><td>POWER (5V)</td></tr><tr><td>3</td><td>TACH</td><td>4</td><td>PWM</td></tr></table>					Pin	Signal	Pin	Signal	1	GND	2	POWER (5V)	3	TACH	4	PWM
	Pin	Signal	Pin	Signal													
	1	GND	2	POWER (5V)													
	3	TACH	4	PWM													
Pin 1 position: At the triangular mark on the right side of the picture.																	

Dual-layer USB 3.0 connector (P5)

Function	Double-layer USB 3.0 Type A connector			
Sign	P5			
Type/Model	Standard Type-A USB 3.0 interface			
Pin definition				
	Pin	Signal	Pin	Signal
	1	VBUS	2	USB 2.0 DN
	3	USB2.0 DP	4	GND
	5	SSRX_N	6	SSRX_P
	7	GND	8	SSTX_N
	9	SSTX_P		



Double-layer USB 2.0 connector (P6)

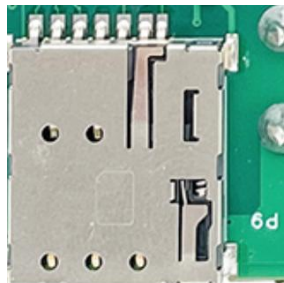
Function	Double-layer USB 2.0 connector																											
Sign	P6																											
Type/Model	Standard Type-A USB 2.0 interface																											
Pin definition	<table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>VBUS</td><td>2</td><td>USB 2.0 DN</td></tr><tr><td>3</td><td>USB2.0 DP</td><td>4</td><td>GND</td></tr><tr><td>5</td><td>NC</td><td>6</td><td>NC</td></tr><tr><td>7</td><td>NC</td><td>8</td><td>NC</td></tr><tr><td>9</td><td>NC</td><td></td><td></td></tr></table>				Pin	Signal	Pin	Signal	1	VBUS	2	USB 2.0 DN	3	USB2.0 DP	4	GND	5	NC	6	NC	7	NC	8	NC	9	NC		
	Pin	Signal	Pin	Signal																								
	1	VBUS	2	USB 2.0 DN																								
	3	USB2.0 DP	4	GND																								
	5	NC	6	NC																								
	7	NC	8	NC																								
	9	NC																										
																												

Micro USB 2.0 (P7)																					
Function	USB 2.0 OTG Function Connector																				
Sign	P7																				
Type/Model	Type-B standard Micro USB 2.0 interface (used for installing the operating system)																				
Pin definition	<table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>VBUS</td><td>2</td><td>USB 2.0 D-</td></tr><tr><td>3</td><td>USB 2.0 D+</td><td>4</td><td>OTG_ID</td></tr><tr><td>5</td><td>GND</td><td></td><td></td></tr></table>				Pin	Signal	Pin	Signal	1	VBUS	2	USB 2.0 D-	3	USB 2.0 D+	4	OTG_ID	5	GND			
	Pin	Signal	Pin	Signal																	
	1	VBUS	2	USB 2.0 D-																	
	3	USB 2.0 D+	4	OTG_ID																	
	5	GND																			
Pin 1 position: At the triangular mark on the right side of the picture.																					

Micro SD card slot (P8)					
Function	Micro SD card slot				
Sign	P8				
Type/Model	Automatic pop-up Micro SD card slot				
Pin definition	Pin	Signal	Pin	Signal	
	1	SD_DATA2	2	SD_DATA3	
	3	SD_CMD	4	VCC_3V3	
	5	SD_CLK	6	GND	
	7	SD_DATA0	8	SD_DATA1	
	9	SD_CD	10	GND	

Nano SIM Card Slot (P9)

Function	Nano SIM Card Slot			
Sign	P9			
Type/Model	Automatic pop-up Nano SIM card slot			
Pin definition	It needs to be used in conjunction with a 4G module. Corresponding to the miniPCle slot at P13.			
	Pin	Signal	Pin	Signal
	C1	SIM_PW R	C2	SIM_RES ET
	C3	SIM_CLK		
	C5	GND	C6	SIM_VPP
	C7	SIM_DAT A	CD	SIM_DET



DC power supply connector (P11)

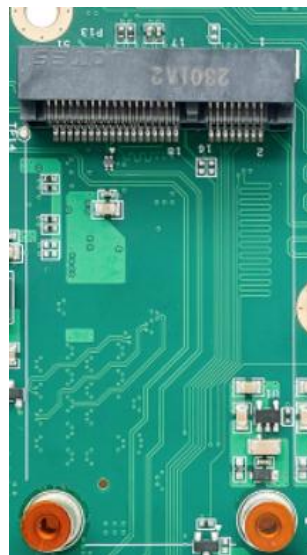
Function	Power input terminal (female connector)										
Sign	P11										
Type/Model	3.5mm Power connection terminal										
Pin definition	Pin 1 position: At the triangular mark on the right side of the picture. <table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>VCC</td><td>2</td><td>GND</td></tr></table>				Pin	Signal	Pin	Signal	1	VCC	2
Pin	Signal	Pin	Signal								
1	VCC	2	GND								

M.2 Key M Socket (P12)

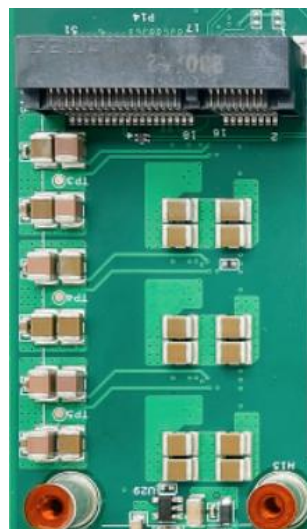
Function	M.2 Key M Socket								
Sign	P12								
Type/Model	M.2 Key M, 2280								
Pin definition	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	
	1	GND	2	VDD	3	GND	4	VDD	
	5	RX3_N	6	NC	7	RX3_P	8	NC	
	9	GND	10	M2_LED	11	TX3_N	12	VDD	
	13	TX3_P	14	VDD	15	GND	16	VDD	
	17	RX2_N	18	VDD	19	RX2_P	20	NC	
	21	GND	22	NC	23	TX2_N	24	NC	
	25	TX2_P	26	NC	27	GND	28	NC	
	29	RX1_N	30	NC	31	RX1_P	32	NC	
	33	GND	34	NC	35	TX1_N	36	NC	
	37	TX1_P	38	NC	39	GND	40	CLK	
	41	RX0_N	42	DAT	43	RX0_P	44	ALERT	
	45	GND	46	NC	47	TX0_N	48	NC	
	49	TX0_P	50	PESET#	51	GND	52	CLKREQ	
	53	CLK_N	54	PEWAKE	55	CLK_P	56	NC	
	57	GND	58	NC	59	NC	60	NC	
	61	NC	62	NC	63	NC	64	NC	
	65	NC	66	NC	67	NC	68	SUSCLK	
	69	NC	70	VDD	71	GND	72	VDD	
	73	GND	74	VDD	75	GND			

MiniPCle Slot (P13)

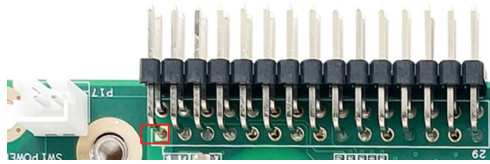
Function	MiniPCle Slot			
Sign	P13			
Type/Model	5.6mm Full-length typeMiniPCle Connector			
Pin definition	Pin	Signal	Pin	Signal
	1	WAKE	2	3.3V
	3	NC	4	GND
	5	NC	6	1.5V
	7	PEIC1_CLKREQ	8	SIM_PWR
	9	GND	10	SIM_DATA
	11	PEIC1_REFCLK_N	12	SIM_CLK
	13	PEIC1_REFCLK_P	14	SIM_RESET
	15	GND	16	SIM_VPP
	17	NC	18	GND
	19	NC	20	NC
	21	GND	22	PEIC1_REST
	23	PERN	24	3.3V
	25	PERP	26	GND
	27	GND	28	1.5V
	29	GND	30	I2C_CLK
	31	PETN	32	I2C_DAT
	33	PETP	34	GND
	35	GND	36	USB2_D_N
	37	GND	38	USB2_D_P
	39	3.3V	40	GND
	41	3.3V	42	3.3V
	43	PEIC_SEL	44	NC
	45	NC	46	NC
	47	NC	48	1.5V
	49	NC	50	GND
	51	NC	52	3.3V

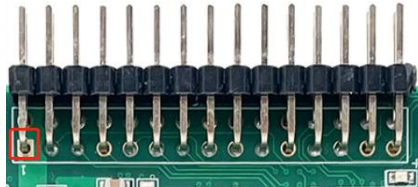


MiniPCle (P14)				
Function	MiniPCle Slot			
Sign	P14			
Type/Model	5.6mm Full-length typeMiniPCle Connector			
Pin definition	Pin	Signal	Pin	Signal
	1	WAKE	2	3.3V
	3	NC	4	GND
	5	NC	6	1.5V
	7	PEIC1_CLKREQ	8	NC
	9	GND	10	NC
	11	PEIC1_REFCLK_N	12	NC
	13	PEIC1_REFCLK_P	14	NC
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	NC
	21	GND	22	PEIC1_RST
	23	PERN	24	3.3V
	25	PERP	26	GND
	27	GND	28	1.5V
	29	GND	30	I2C_CLK
	31	PETN	32	I2C_DAT
	33	PETP	34	GND
	35	GND	36	USB2_D_N
	37	GND	38	USB2_D_P
	39	VCC_3V3_PCIE	40	GND
	41	VCC_3V3_PCIE	42	3.3V
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	1.5V
	49	NC	50	GND
	51	NC	52	3.3V



Multifunctional expansion connector (KZ1)

Function	Multifunctional expansion connector																																																																			
Sign	KZ1																																																																			
Type/Model	2.54mm pitch, 2*15-pin dual-row straight-pin arrangement																																																																			
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Multifunctional expansion connector (KZ2)					
Function	Multifunctional expansion connector				
Sign	KZ2				
Type/Model	2.54mm pitch, 2*15-pin dual-row straight-pin arrangement				
Pin definition	Pin	Signal	Pin	Signal	
	1	3.3V	2	3.3V	
	3	I2S1_DIN_3V3	4	UART5_TX_3V3	
	5	I2S1_DOUT_3V3	6	UART5_RTS_3V3	
	7	I2S1_FS_3V3	8	UART5_RX_3V3	
	9	I2S1_CLK_3V3	10	UART5_CTS_3V3	
	11	MCLK01_3V3	12	SPI1_SCLK_3V3	
	13	PWM01_3V3	14	SPI1_MISO_3V3	
	15	GPIO16_3V3	16	SPI1_MOSI_3V3	
	17	I2C2_DAT_3V3	18	SPI1_CS0_3V3	
	19	I2C2_CLK_3V3	20	SPI1_CS1_3V3	
	21	GND	22	GND	
	23	SYS_STATUS_CTL	24	I2C1_DAT_3V3	
	25	SYS_RUN_CTL	26	I2C1_CLK_3V3	
	27	M2_KEY_LED_CTL	28	I2C3_DAT_3V3	
	29	CAM3_MCLK_3V3	30	I2C3_CLK_3V3	
	UART/I2C Device Name				
		UART5	I2C1	I2C2	I2C3
	AGX Xavier	/dev/ttyTHS4	/dev/i2c-0	/dev/i2c-1	/dev/i2c-3
	AGX ORIN	/dev/ttyTHS2	/dev/i2c-0	/dev/i2c-1	/dev/i2c-2
	GPIO Device Name				
		GPIO16			
	AGX Xavier	463			
	AGX ORIN	PAC.01			

Multifunctional expansion connector (KZ3)						
Function	Multifunctional expansion connector					
Sign	KZ3					
Type/Model	2.54mm pitch, 2*15-pin dual-row straight-pin arrangement					
Pin definition	Pin	Signal	Pin	Signal		
	1	5V	2	5V		
	3	UPHY_TX6_N	4	UPHY_TX6_P		
	5	UPHY_RX6_N	6	UPHY_RX6_P		
	7	NC(pin13)	8	GND		
	9	XFI0_RST_N	10	GPIO25_XFI0_MDIO		
	11	XFI0_INT_N	12	GPIO26_XFI0_MDC		
	13	NC(pin7)	14	GND		
	15	I2C4_DAT_3V3	16	I2C4_CLK_3V3		
	17	VOUT=VIN	18	GND		
	19	VOUT=VIN	20	GND		
	21	VOUT=VIN	22	GND		
	23	VOUT=VIN	24	GND		
	25	VOUT=VIN	26	GND		
	27	VOUT=VIN	28	GND		
	29	VOUT=VIN	30	GND		
	I2C Device Name					
			I2C4			
	AGX Xavier		/dev/i2c-7			
	AGX ORIN		/dev/i2c-7			

6 Method of Application

- Make sure that the voltages of all external systems have been turned off.
- Install the Jetson core module onto the J1 high-speed connector. During the installation process, pay attention to the alignment between the connectors and apply force evenly. After the module is installed in place, install the core module fixing screws.
- Install the necessary external cables. (Such as the display cable connected to the HDMI display, the power input cable for powering the system, the USB cable linking the keyboard and mouse, the camera, the MiniPCle function expansion module...)
- Turn on the DC12V power supply (please ensure that the cooling device on the core module is installed before powering on the system).
- For systems without a protective casing, after powering on the system, avoid moving the hardware system and strictly prohibit touching the circuit board and any electronic components on it with your body.

7 Recovery Mode

The Jetson core module can operate in normal mode and Recovery mode. In Recovery mode, operations such as file system update, kernel update, Bootloader/UEFI update, BCT update, etc. can be performed.

The steps to enter Recovery mode are as follows:

Turn off the power supply of the system.

Connect the Micro-USB cable of Y-C13's Micro-USB port (P7) to the USB port of the Jetson development host.

Press and hold the Recovery button (SW3) without releasing it. Supply power to the system, and keep SW3 button pressed for more than 3 seconds after power supply. Then release the Recovery button.

The system enters Recovery mode. At this point, you can perform subsequent operations.