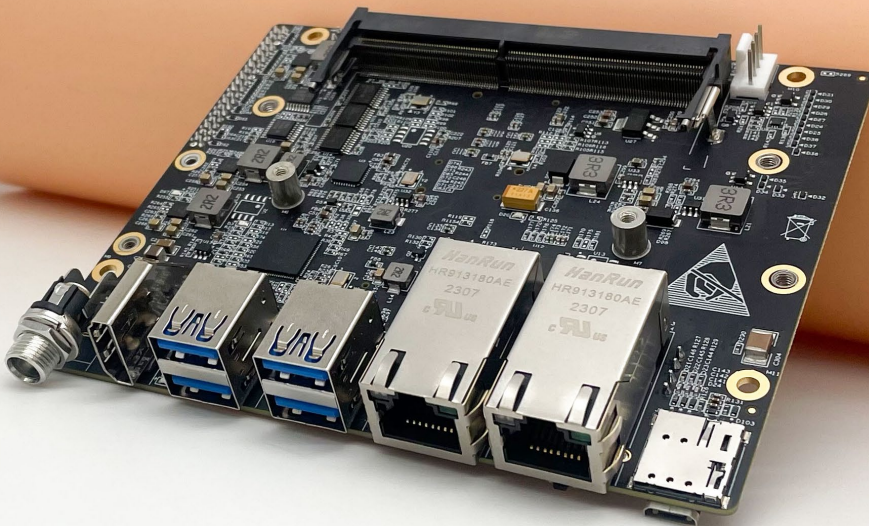




AI Development Carrier Board

Y-C11

Datasheet



Version V2.0

Date 2024-02-28

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Document History

Version	Date	Description of Change	Hardware Version
V 1.0	2023-3-30	Preliminary Release	V 1.0
V 1.1	2022-4-12	Change the picture description of external interface functions and locations in Chapter 2	V 1.0
V 2.0	2024-1-9	Modify the product manual template; Added interface test description; Added Jetpack5.* version GPIO mapping number;	V1.0

Hardware Update History

Version	Date	Description of Change
V 1.0	2022-2-10	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.

Table of Contents

1 Introduction	6
2 Specifications	7
3 External I/O Ports	11
4 All-Round Display	13
5 Connector Description	14
6 Ordering Information	28
7 Recovery Mode	28
8 Method of Application	29
9 GPIO Test	30
10 CAN Test	31
11 Serial Port Test	32
12 Special Instructions	33

1 Introduction



Y-C11 is an interface board equipped with NVIDIA Jetson Orin NX/ORIN NANO/Xavier NX series core modules. The whole board device adopts wide temperature industrial model, the main interface is designed for electrostatic safety protection, and the power supply application scheme with high reliability is adopted. The input power supply has the function of overvoltage and reverse polarity protection. With a rich external interface, it can be equipped with hundreds of functional modules through a miniPCIe connector (including USB2.0 and PCIe X1 signals) to achieve further expansion of system functions.

The 4G/5G communication module can be directly installed in the M.2 Key B slot of the Y-C11 carrier board. Onboard with Nano SIM card slot, independent dual gigabit network port can expand POE power support.

2 Specifications

	Specific
Carrier Board	Y-C11
Module	NVIDIA Jetson ORIN NX/ORIN NANO/Xavier NX Series Modules
Temperature	-40 ~ +85°C
Dimensions (L×W×H)	120mm * 102mm * 23mm (Including I/O ports and mounting holes)
Weight	112g

Power Supply	Spec
Input Type	DC
Input Voltage	+12V ~ +24V

I/O Ports

Interface	Quantity	Interface	Quantity
USB3.0 Type-A	4	Micro USB	1
miniPCIe Slot	1	HDMI	1
M.2 Key M Slot (2242)	2	M.2 Key B Slot(3050)	1
RTC Battery Connector	1	Ethernet Jack	2
4 Lane MIPI CSI	2	Nano SIM Card Slot	1
Fan Header(12V)	1	Power Jack	1
40pin Expansion Header	4*GPIO/2*I2C/2*SPI/1*CAN/2*UART/I*I2S/1*USB2.0		

Note:

When used with the Jetson Xavier NX module, only two USB Type A support full speed 3.0, the rest are USB2.0, and one M.2 Key M interface is unavailable.

NVIDIA Jetson Series Modules

Technical Specifications

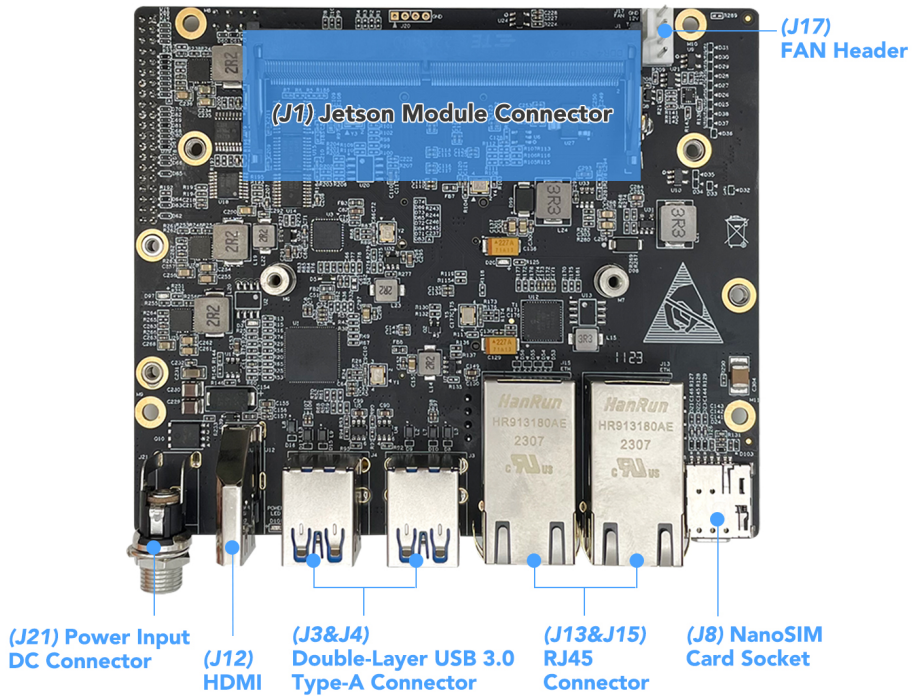
Module	Jetson ORIN NX 16GB	Jetson ORIN NX 8GB	Jetson Orin Nano 8GB	Jetson Orin Nano 4GB
AI Performance	100 TOPS	70 TOPS	40 TOPS	20 TOPS
GPU	1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores		1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores	512-core NVIDIA Ampere architecture GPU with 16 Tensor Cores
CPU	8-core Arm® Cortex®-A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3	6-core Arm® Cortex®-A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3	6-core Arm® Cortex®-A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3	
Memory	16GB 128-bit LPDDR5 102.4GB/s	8GB 128-bit LPDDR5 102.4GB/s	8GB 128-bit LPDDR5 68 GB/s	4GB 64-bit LPDDR5 34 GB/s
Storage	Support external NVME		Support external NVME	
Video Encode	1x 4K60 (H.265) 3x 4K30 (H.265) 6x 1080p60 (H.265) 12x 1080p30 (H.265)		1080p30 supported by 1-2 CPU cores	
Video Decode	1x 8K30 (H.265) 2x 4K60 (H.265) 4x 4K30 (H.265) 9x 1080p60 (H.265) 18x 1080p30 (H.265)		1x 4K60 (H.265) 2x 4K30 (H.265) 5x 1080p60 (H.265) 11x 1080p30 (H.265)	
Power	10W - 25W	10W - 20W	7W - 15W	7W - 10W

NVIDIA Jetson Series Modules

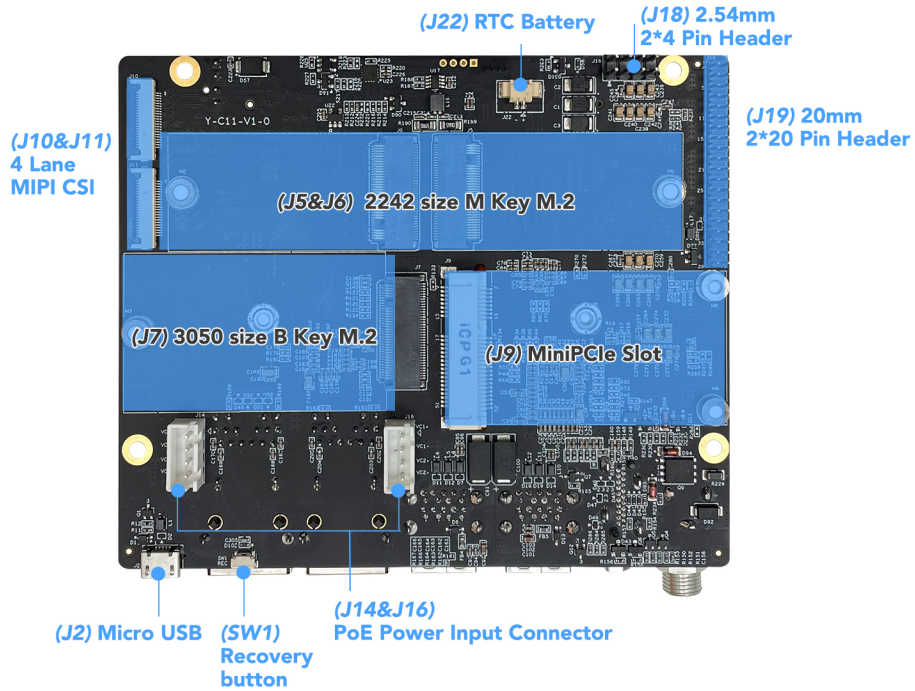
Technical Specifications

Module	Xavier NX 16GB	Xavier NX 8GB
AI Performance	21TOPS	
GPU	384-core NVIDIA Volta™ architecture GPU with 48 Tensor Cores	
CPU	6-core NVIDIA Carmel Arm®v8.2 64-bit CPU 6MB L2 + 4MB L3	
Memory	16 128-bit LPDDR4x 59.7GB/s	8GB 128-bit LPDDR4x 59.7GB/s
Storage	16GB eMMC 5.1	
Video Encode	2x 4K60 (H.265) 4x 4K30 (H.265) 10x 1080p60 (H.265) 22x 1080p30 (H.265)	
Video Decode	2x 8K30 (H.265) 6x 4K60 (H.265) 12x 4K30 (H.265) 22x 1080p60 (H.265) 44x 1080p30 (H.265)	
Power	10W – 20W	
Mechanical	69.6mm x 45mm 260-pin SO-DIMM connector	

3 External I/O Ports



Sign	Function	Sign	Function
J1	Jetson Module Connector	J3/J4	Type A USB 3.0 (x2 stacked)
J17	12V FAN Header	J13/J15	Ethernet Jack
J12	Type-A HDMI Connector	J21	Power Jack
J8	Nano SIM Card Slot		

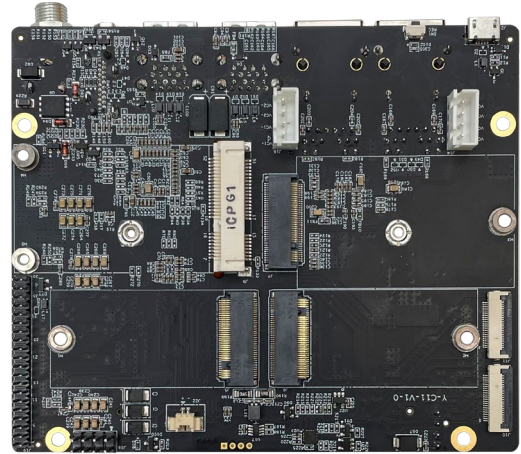
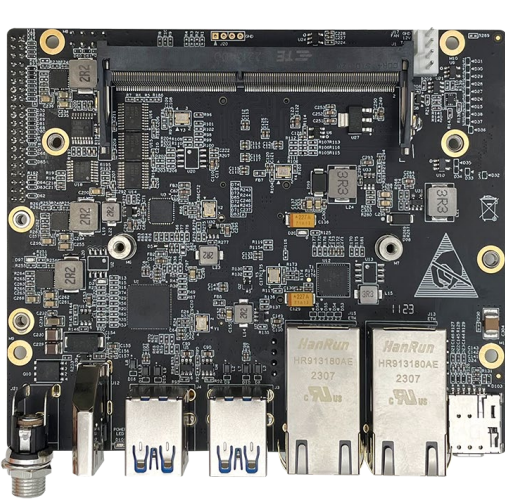


Sign	Function	Sign	Function
J5	2242 Size, M.2 key M Slot (PCIe x4)	J2	Micro USB Connector
J6	2242 Size, M.2 key M Slot (PCIe x2)	J7	3050 Size, M.2 key B Slot
J10/J11	4 lane MIPI CSI	J9	miniPCIe Slot (PCIe x1 + USB 2.0)
J19	2.0mm pitch, 2x20pin Header	J22	RTC Battery Header
J14	J13 POE power supply Header	J16	J15 POE power supply Header
J18	2.54mm pitch, 2x4pin Header	SW1	Recovery Button

LED

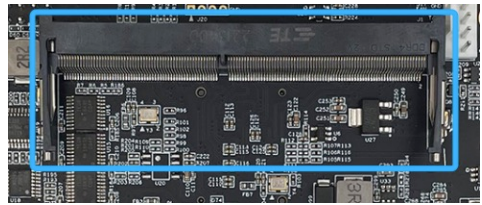
Size	Function
D101	Core module operating status indicator
D97	Carrier power supply status indicator

4 All-Round Display

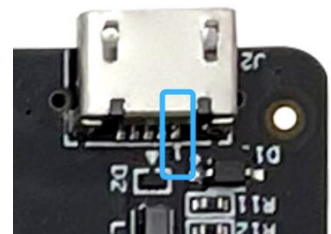


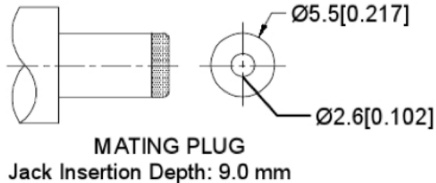

5 Connector Description

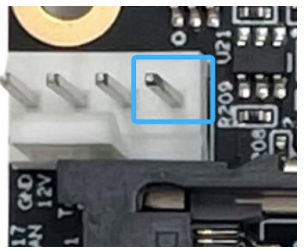
Jetson Module Connector (J1)	
Function	Connect NVIDIA Jetson Orin NX / Orin Nano/Xavier NX Series Modules
Sign	J1
Type/Model	2309413-1
Explain	For pin definitions of this connector, refer to the pin definition instructions in the NVIDIA Jetson Series Orin NX Core Module data book



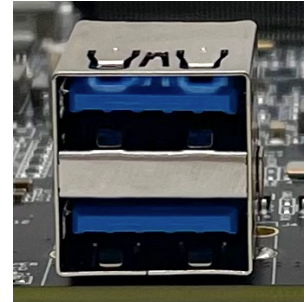
Micro USB 2.0 (J2)																	
Function	USB 2.0 OTG Connector																
Sign	J2																
Type/Model	Type-B standard Micro USB 2.0 connector (Use to flash system)																
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VBUS</td> <td>2</td> <td>USB0_D_N</td> </tr> <tr> <td>3</td> <td>USB0_D_P</td> <td>4</td> <td>NC</td> </tr> <tr> <td>5</td> <td>GND</td> <td></td> <td></td> </tr> </tbody> </table> <p>Pin 1 position: right picture identification.</p>	Pin	Signal	Pin	Signal	1	VBUS	2	USB0_D_N	3	USB0_D_P	4	NC	5	GND		
Pin	Signal	Pin	Signal														
1	VBUS	2	USB0_D_N														
3	USB0_D_P	4	NC														
5	GND																



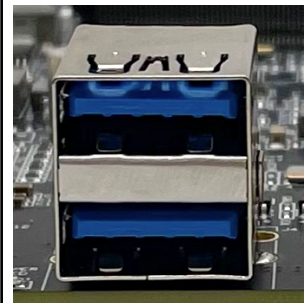
Power Jack (J21)	
Function	Power supply input terminal
Sign	J21
Type/Model	DC-026LBM-5A-2.5
Pin definition	<p>Input voltage range: DC 12V-24V Contact inner diameter: 2.5mm; Contact outside diameter: 5.6mm.</p>  <p>MATING PLUG Jack Insertion Depth: 9.0 mm</p>
	

Fan Header (J17)													
Function	4-pin fan header for 12V PWM fan												
Sign	J17												
Type/Model	47053-1000												
Pin definition	<table border="1" data-bbox="361 1406 868 1551"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> <td>2</td> <td>POWER (12V)</td> </tr> <tr> <td>3</td> <td>TACH</td> <td>4</td> <td>PWM</td> </tr> </tbody> </table> <p>This connector outputs 12V voltage. Pin 1 position: right picture identification.</p>	Pin	Signal	Pin	Signal	1	GND	2	POWER (12V)	3	TACH	4	PWM
Pin	Signal	Pin	Signal										
1	GND	2	POWER (12V)										
3	TACH	4	PWM										
													


USB 3.0 Connector (J3)																									
Function	USB 3.0 Type A																								
Sign	J3																								
Type/Model	Type-A Standard USB 3.0 Connector (x2 stacked)																								
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VBUS</td> <td>2</td> <td>USB2_D_N</td> </tr> <tr> <td>3</td> <td>USB2_D_N</td> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>SSRX_N</td> <td>6</td> <td>SSRX_P</td> </tr> <tr> <td>7</td> <td>GND</td> <td>8</td> <td>SSTX_N</td> </tr> <tr> <td>9</td> <td>SSTX_P</td> <td></td> <td></td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	VBUS	2	USB2_D_N	3	USB2_D_N	4	GND	5	SSRX_N	6	SSRX_P	7	GND	8	SSTX_N	9	SSTX_P		
	Pin	Signal	Pin	Signal																					
1	VBUS	2	USB2_D_N																						
3	USB2_D_N	4	GND																						
5	SSRX_N	6	SSRX_P																						
7	GND	8	SSTX_N																						
9	SSTX_P																								
<p>When the Xavier NX module is installed, the port near the PCB supports only USB2.0, and the other port supports USB3.0.</p>																									



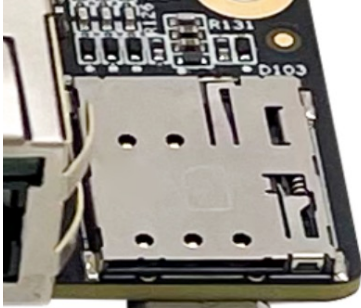
USB 3.0 Connector (J4)																									
Function	USB 3.0 Type A																								
Sign	J4																								
Type/Model	Type-A Standard USB 3.0 Connector (x2 stacked)																								
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VBUS</td> <td>2</td> <td>USB2_D_N</td> </tr> <tr> <td>3</td> <td>USB2_D_N</td> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>SSRX_N</td> <td>6</td> <td>SSRX_P</td> </tr> <tr> <td>7</td> <td>GND</td> <td>8</td> <td>SSTX_N</td> </tr> <tr> <td>9</td> <td>SSTX_P</td> <td></td> <td></td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	VBUS	2	USB2_D_N	3	USB2_D_N	4	GND	5	SSRX_N	6	SSRX_P	7	GND	8	SSTX_N	9	SSTX_P		
	Pin	Signal	Pin	Signal																					
1	VBUS	2	USB2_D_N																						
3	USB2_D_N	4	GND																						
5	SSRX_N	6	SSRX_P																						
7	GND	8	SSTX_N																						
9	SSTX_P																								
<p>When the Xavier NX module is installed, the port near the PCB supports USB3.0, and the other port supports only USB2.0.</p>																									



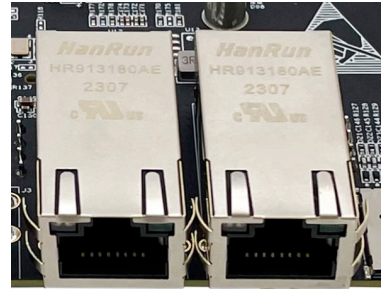
HDMI Connector (J12)				
Function	Type A HDMI Connector			
Sign	J12			
Type/Model	Type-A Standard HDMI Connector			
Pin definition	Pin	Signal	Pin	Signal
	1	HDMI_TX2_P	2	GND
	3	HDMI_TX2_N	4	HDMI_TX1_P
	5	GND	6	HDMI_TX1_N
	7	HDMI_TX0_P	8	GND
	9	HDMI_TX0_N	10	HDMI_TXC_P
	11	GND	12	HDMI_TXC_N
	13	HDMI_CEC	14	NC
	15	DDC_SCL	16	DDC_SDA
	17	GND	18	VCC_HDMI
	19	HDMI_HPD		



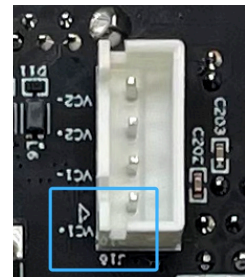
SIM Card Slot (J8)				
Function	Nano SIM Card Slot			
Sign	J8			
Type/Model	Nano SIM Card Slot			
Pin definition	Pin	Signal	Pin	Signal
	C1	USIM_PWR	C2	USIM_RESET
	C3	USIM_CLK	C5	GND
	C6	NC	C7	USIM_DATA
	CD	USIM_DET		



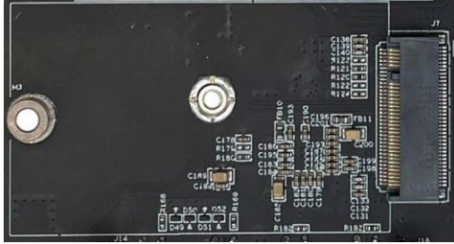
Ethernet Jack (J13 & J15)																					
Function	10/100/1000Mbps Ethernet																				
Sign	J13 & J15																				
Type/Model	Extensible RJ45 cable connector with POE++ specification																				
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TP0+</td> <td>2</td> <td>TP0-</td> </tr> <tr> <td>3</td> <td>TP1+</td> <td>4</td> <td>TP2+</td> </tr> <tr> <td>5</td> <td>TP2-</td> <td>6</td> <td>TP1-</td> </tr> <tr> <td>7</td> <td>TP3+</td> <td>8</td> <td>TP3-</td> </tr> </tbody> </table> <p>J14 and J16 connectors provide standard/non-standard PoE power support for J13 and J15 connectors. For details, please contact our technical staff.</p>	Pin	Signal	Pin	Signal	1	TP0+	2	TP0-	3	TP1+	4	TP2+	5	TP2-	6	TP1-	7	TP3+	8	TP3-
Pin	Signal	Pin	Signal																		
1	TP0+	2	TP0-																		
3	TP1+	4	TP2+																		
5	TP2-	6	TP1-																		
7	TP3+	8	TP3-																		



PoE Power Supply Expansion Connector (J14 & J16)													
Function	PoE Power supply expansion connector												
Sign	J14 & J16												
Type/Model	XH-4PA												
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VC1+</td> <td>2</td> <td>VC1-</td> </tr> <tr> <td>3</td> <td>VC2+</td> <td>4</td> <td>VC2-</td> </tr> </tbody> </table> <p>Standard/non-standard PoE power support for J13 and J15 connectors is available through J14 and J16, respectively. For details, please contact our technical staff.</p> <p>Pin 1 Position: the logo of the basket frame in the picture on the right.</p>	Pin	Signal	Pin	Signal	1	VC1+	2	VC1-	3	VC2+	4	VC2-
Pin	Signal	Pin	Signal										
1	VC1+	2	VC1-										
3	VC2+	4	VC2-										

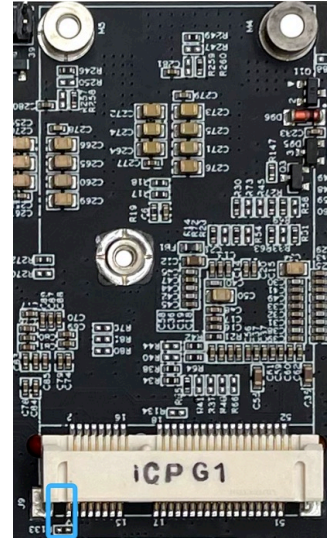


M.2 Key B Slot (J7)

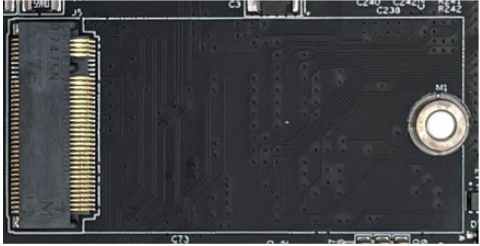
Function	M.2 Key B Slot	
Sign	J7	
Type/Model	B Key , 3050 Size	

Pin definition	Pin	Signal	Pin	Signal	Pin	Signal
	1	NC	2	VCC_3V8	3	GND
	4	VCC_3V8	5	GND	6	RM_FULL_CARD_POWER_OFF
	7	USB_D1_P	8	RM_W_DISABLE1_N_1V8	9	USB_D1_N
	10	RM_WWAN_LED_N	11	GND	12	NC
	13	NC	14	NC	15	NC
	16	NC	17	NC	18	NC
	19	NC	20	NC	21	NC
	22	NC	23	WAKE_WAN_N_1V8	24	NC
	25	NC	26	RM_B_CORE_OUT_1V8	27	GND
	28	NC	29	USBSS_DS4_RX_N	30	RM_USIM_RESET
	31	USBSS_DS4_RX_P	32	RM_USIN_CLK	33	GND
	34	RM_USIM_DATA	35	USBSS_DS4_TX_N	36	RM_USIM_PWR
	37	USBSS_DS4_TX_P	38	VCC_1V8	39	GND
	40	NC	41	NC	42	NC
	43	NC	44	NC	45	GND
	46	NC	47	NC	48	NC
	49	NC	50	NC	51	GND
	52	NC	53	NC	54	NC
	55	NC	56	NC	57	GND
	58	NC	59	NC	60	NC
	61	NC	62	NC	63	NC
	64	NC	65	NC	66	RM_USIM_DET
	67	RM_RESET_N	68	VCC_1V8	69	NC
70	VCC_3V8	71	GND	72	VCC_3V8	
73	GND	74	VCC_3V8	75	NC	

miniPCIe Slot (J9)				
Function	miniPCIe Slot			
Sign	J9			
Type/Model	5.6mm high, support full-length expansion cards.			
Pin definition	Pin	Signal	Pin	Signal
	1	PCIE_WAKE_N	2	VCC_3V3_PCIE
	3	NC	4	GND
	5	NC	6	VCC_1V5_PCIE
	7	PEIC1_CLKREQ_N	8	NC
	9	GND	10	NC
	11	PEIC1_CLK_N	12	NC
	13	PEIC1_CLK_P	14	NC
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	NC
	21	GND	22	PEIC1_RST_N_3V3
	23	PCIE1_RX0_N	24	VCC_3V3_PCIE
	25	PCIE1_RX0_P	26	GND
	27	GND	28	VCC_1V5_PCIE
	29	GND	30	NC
	31	PCIE1_TX0_N	32	NC
	33	PCIE1_TX0_P	34	GND
	35	GND	36	USB1_DS4_D3_N
	37	GND	38	USB1_DS4_D3_P
	39	VCC_3V3_PCIE	40	GND
	41	VCC_3V3_PCIE	42	NC
	43	GND	44	NC
	45	NC	46	NC
47	NC	48	VCC_1V5_PCIE	
49	NC	50	GND	
51	NC	52	VCC_3V3_PCIE	

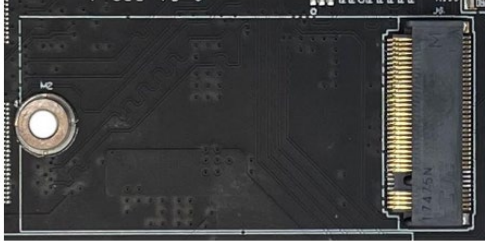


M.2 Key M Slot (J5)

Function	M.2 Key M Slot	
Sign	J5	
Type/Model	M Key , 2242 Size	

Pin definition	Pin	Signal	Pin	Signal	Pin	Signal
	1	GND	2	VCC_3V3	3	GND
	4	VCC_3V3	5	PCIE0_RX3_N	6	NC
	7	PCIE0_RX3_P	8	NC	9	GND
	10	NC	11	PCIE0_TX3_N	12	VCC_3V3
	13	PCIE0_TX3_P	14	VCC_3V3	15	GND
	16	VCC_3V3	17	PCIE0_RX2_N	18	VCC_3V3
	19	PCIE0_RX2_P	20	NC	21	GND
	22	NC	23	PCIE0_TX2_N	24	NC
	25	PCIE0_TX2_P	26	NC	27	GND
	28	NC	29	PCIE0_RX1_N	30	NC
	31	PCIE0_RX1_P	32	NC	33	GND
	34	NC	35	PCIE0_TX1_N	36	NC
	37	PCIE0_TX1_P	38	NC	39	GND
	40	I2C2_SCL_0_1V8	41	PCIE0_RX0_N	42	I2C2_SDA_0_1V8
	43	PCIE0_RX0_P	44	M2_KEYM_ALERT_N_1V8	45	GND
	46	NC	47	PCIE0_TX0_N	48	NC
	49	PCIE0_TX0_P	50	PCIE0_RST_N_3V3	51	GND
	52	PCIE0_CLKREQ_N_3V3	53	PCIE0_CLK_P	54	PCIE_WAKE_N_3V3
	55	PCIE0_CLK_N	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(32KHz)	69	NC
	70	VCC_3V3	71	GND	72	VCC_3V3
	73	GND	74	VCC_3V3	75	GND

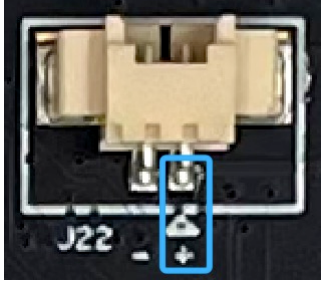
M.2 Key M Slot (J6)

Function	M.2 Key M Slot	
Sign	J6	
Type/Model	M Key , 2242 Size	


When the Xavier NX module is installed, the current port is unavailable.


Pin definition	Pin	Signal	Pin	Signal	Pin	Signal
		1	GND	2	VCC_3V3	3
	4	VCC_3V3	5	NC	6	NC
	7	NC	8	NC	9	GND
	10	NC	11	NC	12	VCC_3V3
	13	NC	14	VCC_3V3	15	GND
	16	VCC_3V3	17	NC	18	VCC_3V3
	19	NC	20	NC	21	GND
	22	NC	23	NC	24	NC
	25	NC	26	NC	27	GND
	28	NC	29	PCIE2_RX1_N	30	NC
	31	PCIE2_RX1_P	32	NC	33	GND
	34	NC	35	PCIE2_TX1_N	36	NC
	37	PCIE2_TX1_P	38	NC	39	GND
	40	I2C2_SCL_1_1V8	41	PCIE2_RX0_N	42	I2C2_SDA_1_1V8
	43	PCIE2_RX0_P	44	M2_KEYM_ALERT_N_1V8	45	GND
	46	NC	47	PCIE2_TX0_N	48	NC
	49	PCIE2_TX0_P	50	PCIE2_RST_N_3V3	51	GND
	52	PCIE2_CLKREQ_N_3V3	53	PCIE2_CLK_P	54	PCIE_WAKE_N_3V3
	55	PCIE2_CLK_N	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(32KHz)	69	NC
	70	VCC_3V3	71	GND	72	VCC_3V3
	73	GND	74	VCC_3V3	75	GND

RTC Battery Socket (J22)				
Function	Provides power support for the core board clock circuit			
Sign	J22			
Type/Model	53261-0271			
Pin definition	Pin	Signal	Pin	Signal
	1	VCC (3.3V)	2	GND
Pin 1 position: right picture identification.				



8-pin Header (J18)				
Function	Debug & power header			
Sign	J18			
Type/Model	2.54mm pitch, 2*4pin			
Pin definition	Pin	Signal	Pin	Signal
	1	3.3V	2	Power Button
	3	UART2_TX_3V3	4	GND
	5	UART2_RX_3V3	6	Reset Button
	7	GND	8	GND
By default, UART2 is the kernel debugging serial port, which is used to output C-BOOT, U-BOOT, and Linux kernel information. After the Linux kernel is started, UART2 is used as the serial port of the display and control terminal: 115200, 8N1 .				



MIPI CSI (J10)																																																					
Function	4 Lane MIPI CSI Camera Connector																																																				
Sign	J10																																																				
Type/Model	FG0.5-H2.0-22PIN																																																				
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> <td>2</td> <td>CSI1_D0_N</td> </tr> <tr> <td>3</td> <td>CSI1_D0_P</td> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>CSI1_D1_N</td> <td>6</td> <td>CSI1_D1_P</td> </tr> <tr> <td>7</td> <td>GND</td> <td>8</td> <td>CSI0_CLK_N</td> </tr> <tr> <td>9</td> <td>CSI0_CLK_P</td> <td>10</td> <td>GND</td> </tr> <tr> <td>11</td> <td>CSI0_D0_N</td> <td>12</td> <td>CSI0_D0_P</td> </tr> <tr> <td>13</td> <td>GND</td> <td>14</td> <td>CSI0_D1_N</td> </tr> <tr> <td>15</td> <td>CSI0_D1_P</td> <td>16</td> <td>GND</td> </tr> <tr> <td>17</td> <td>CAM0_PWDN_3V3</td> <td>18</td> <td>CAM0_MCLK_1V8</td> </tr> <tr> <td>19</td> <td>GND</td> <td>20</td> <td>CAM0_I2C_SCL_3V3</td> </tr> <tr> <td>21</td> <td>CAM0_I2C_SDA_3V3</td> <td>22</td> <td>VCC_3V3</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	GND	2	CSI1_D0_N	3	CSI1_D0_P	4	GND	5	CSI1_D1_N	6	CSI1_D1_P	7	GND	8	CSI0_CLK_N	9	CSI0_CLK_P	10	GND	11	CSI0_D0_N	12	CSI0_D0_P	13	GND	14	CSI0_D1_N	15	CSI0_D1_P	16	GND	17	CAM0_PWDN_3V3	18	CAM0_MCLK_1V8	19	GND	20	CAM0_I2C_SCL_3V3	21	CAM0_I2C_SDA_3V3	22	VCC_3V3				
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MIPI CSI (J11)				
Function	4 Lane MIPI CSI Camera Connector			
Sign	J11			
Type/Model	FG0.5-H2.0-22PIN			
Pin definition	Pin	Signal	Pin	Signal
	1	GND	2	CSI3_D0_N
	3	CSI3_D0_P	4	GND
	5	CSI3_D1_N	6	CSI3_D1_P
	7	GND	8	CSI2_CLK_N
	9	CSI2_CLK_P	10	GND
	11	CSI2_D0_N	12	CSI2_D0_P
	13	GND	14	CSI2_D1_N
	15	CSI2_D1_P	16	GND
	17	CAM1_PWDN_3V3	18	CAM1_MCLK_1V8
	19	GND	20	CAM1_I2C_SCL_3V3
	21	CAM1_I2C_SDA_3V3	22	VCC_3V3



40-pin Extension Header (J19)																																																																																					
Function	Multi-function signal extension interface																																																																																				
Sign	J19																																																																																				
Type/Model	40-pin (2.0mm pitch, 2*20)																																																																																				
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<p>The UART0 and UART1 serial ports are TTL serial ports. The device file names mapped in Linux are shown in the following table:</p> <table border="1"> <thead> <tr> <th></th> <th>UART0</th> <th>UART1</th> </tr> </thead> <tbody> <tr> <td>Xavier NX</td> <td>/dev/ttyTHS1</td> <td>/dev/ttyTHS0</td> </tr> <tr> <td>ORIN NX</td> <td>/dev/ttyTHS1</td> <td>/dev/ttyTHS0</td> </tr> <tr> <td>ORIN NANO</td> <td>/dev/ttyTHS1</td> <td>/dev/ttyTHS0</td> </tr> </tbody> </table> <p>Pin 1 position: right picture identification.</p>			UART0	UART1	Xavier NX	/dev/ttyTHS1	/dev/ttyTHS0	ORIN NX	/dev/ttyTHS1	/dev/ttyTHS0	ORIN NANO	/dev/ttyTHS1	/dev/ttyTHS0																																																																								
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40-pin Extension Header (J19)

Pin definition

I2C device file names mapped in the system are shown in the following table:

	i2c0	i2c1
Xavier NX	/dev/i2c-1	/dev/i2c-8
ORIN NX	/dev/i2c-1	/dev/i2c-7
ORIN NANO	/dev/i2c-1	/dev/i2c-7

The resulting GPIO mapping numbers are shown in the following table. GPIO high level voltage is 3.3V.

	GPIO02	GPIO03	GPIO07	GPIO13
Xavier NX(<=L4T32.*)	419	264	424	393
Xavier NX(>L4T 32.*)	438(PQ.03)	317(PCC.00)	443(PR.00)	419(PN.01)
ORIN NX	446(PP.06)	328(PCC.00)	389(PG.06)	391(PH.00)
ORIN NANO	446(PP.06)	328(PCC.00)	389(PG.06)	391(PH.00)

Description:

Take the Xavier NX module, GPIO02, as an example, if the system version is L4T32.*, run this command:

```
$ echo 419 > /sys/class/gpio/export
```

After GPIO is enabled, the corresponding file name is generated: gpio419;

Then system version is later then L4T 32.*, run this command:

```
$ echo 438 > /sys/class/gpio/export
```

After GPIO is enabled, the corresponding file name is generated: PQ.03.

6 Ordering Information

Order Type	Function
Y-C11	NVIDIA® Jetson™ ORIN NX/ORIN NANO/Xavier NX series module is equipped with miniaturized carrier board.

E-commerce Platform

Taobao store Address: <https://shop333807435.taobao.com/>

Jingdong Store Address: <https://mall.jd.com/index-11467104.html?from=pc>

Ali International Station Address: <https://plink-ai.en.alibaba.com/>

7 Recovery Mode

Jetson core module can work in normal mode and Recovery mode. In Recovery mode, it can perform file system update, kernel update, Bootloader/UEFI update, BCT update and other operations.

To enter the Recovery mode, perform the following steps:

Power off the system.

Use a Micro-USB cable to connect the Micro-USB port (J2) of the Y-C11 to the Jetson development host USB port.

The Jetson development host should be Ubuntu18.04 or Ubuntu20.04 based on X86 architecture.

Press the Recovery key (SW1) to power the system. Hold down the Recovery key (SW1) for more than 3 seconds, and then release the Recovery key (SW1).

When the system enters Recovery mode, you can perform subsequent operations.

8 Method of Application

- Make sure all external system voltages are off.
- Install the Jetson core module onto the J1 high-speed connector. Ensure that the connectors are aligned with even force. After the module is installed in place, install the core module fixing screws.
- Install necessary external cables. (such as: the display line connected to the HDMI display, the power input line for the system power supply, the USB cable connecting the keyboard and mouse...)
- Connect the power cable to the power supply.(Make sure that the heat dissipation device on the core module is installed before power-on)
- For a system without a protective cover, do not move the hardware system after the system is powered on. Do not touch the circuit board or any electronic components on the circuit board with your body.

9 GPIO Test

Y-C11 with Jetson module comes standard with 4 GPIOs. Programmable output voltage 3.3V, please note that the input voltage does not exceed 3.3V.

Take L4T35.3.1, GPIO02 as an example when equipped with ORIN NX module:

The content after the '#' in the following command is a comment and does not need to be added when executing the command.

- `sudo su`
- `echo 446 > /sys/class/gpio/export #Enabel GPIO (Or initializeGPIO)`
- `echo out > /sys/class/gpio/PP.06/direction`
Set the GPIO input and output directions to out or in.
- `echo 1 > /sys/class/gpio/PP.06/value`
Set the GPIO output high/low level to 1 for high and 0 for low.

The preceding absolute path name is based on the actual path name generated after GPIO is enabled.

When set to the input state, you can only read values. When set to the output state, you can read and write values.

- `cat /sys/class/gpio/PP.06/value #Get GPIO value.`

The output state can be measured using a multimeter to measure the voltage between the specific lead heel GND.

10 CAN Test

Y-C11 is equipped with one CAN signals when it is equipped with Jetson module. During test, connect the CAN_H of the device to the CAN_H of the device under test and the CAN_L to the CAN_L of the device under test.

The test command is as follows:

- `sudo apt-get install busybox can-utils`

#Writes the specified value to a register

Different modules need to write to the address of the register, and the value written is inconsistent. See the links at the end of this section for details.

- `sudo busybox devmem 0x0c303020 w 0x458`
- `sudo busybox devmem 0x0c303018 w 0x400`
- `sudo busybox devmem 0x0c303010 w 0x458`
- `sudo busybox devmem 0x0c303008 w 0x400`
- `sudo modprobe can` #Load the CAN bus subsystem support module
- `sudo modprobe can_raw` #Load the original CAN protocol module.
- `sudo modprobe mttcan` #Load CAN interface support
- `sudo ip link set can0 type can bitrate 500000`
#Set CAN0 bit rate to 500k bps
- `sudo ip link set can1 type can bitrate 500000`
#Set CAN1 bit rate to 500k bps
- `sudo ip link set up can0` #Open CAN0
- `sudo ip link set up can1` #Open CAN1
- `candump can0` #Set CAN0 to receive
- `cansend can1 1F223344#1122334455667788`

Open another terminal to send data through CAN1. After sending, there will be data echo at the receiving end of CAN0.

See links for different module register values:

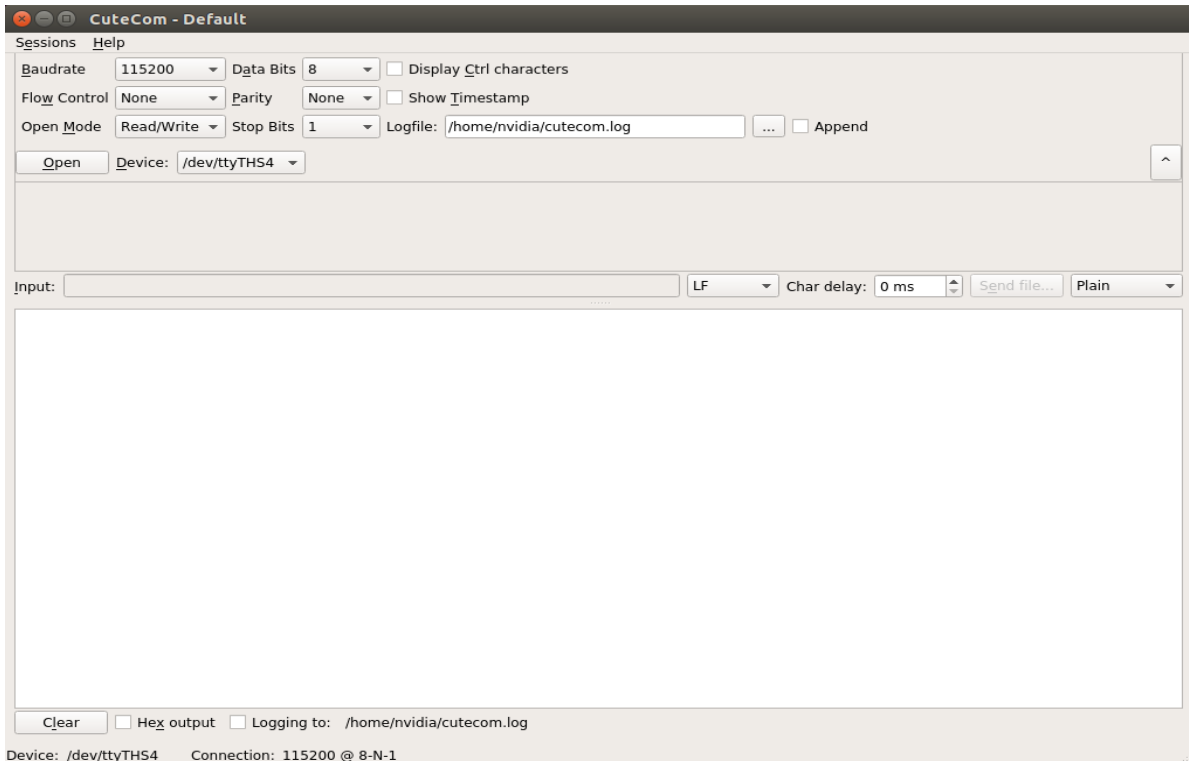
[Controller Area Network \(CAN\) — Jetson Linux Developer Guide documentation \(nvidia.com\)](#)

11 Serial Port Test

Y-C11 is equipped with two 3.3V TTL serial ports as standard when it is paired with Jetson module, which can be used for self-collecting test of a single serial port and interconnection test of two serial ports. The command is as follows:

- `sudo apt-get install cutecom` #Install the serial port test tool
- `sudo cutecom` # For a single-serial port test, you only need to open one cutecom interface on each terminal. For a two-serial port connection test, use two terminals and open two cutecom interfaces.
- When testing a single serial port, connect the RX of a single serial port to the TX. When the two serial ports are connected, the RX of UART1 is connected to the TX of UART2, and the TX of UART1 is connected to the RX of UART2.

The interface of the serial port test tool cutecom is as follows:



12 Special Instructions

- Initial system username: **nvidia** , password: **nvidia** , no password su. If root permissions are required, use sudo to grant permissions, or use sudo su to access the root user.
- The pre-installed system is pure by default and does not contain Jetpack software. You can use the following command to install the software. Do not replace or modify the default software source before installation:
 - `sudo apt-get update`
 - `sudo apt-get install nvidia-jetpack`
- It can also be installed over the network using SDKmanager software.
- For more information please refer to [:Jetson wiki \(plink-ai.com\)](https://wiki.plink-ai.com/jetson)