

Y-C6 Carrier Board Datasheet



Document History

Version	Date	Description of Change	Applicable Hardware Version
V1.0	April 25, 2021	Create a Document	V1.0
V1.1	June 27, 2022	Changed the Document Name: Specification->Datasheet	V1.0
V1.2	May 22, 2023	Add Jetpack5.* version GPIO mapping number and serial port device name.	V1.0

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Electronic components and circuits are very sensitive to electrostatic discharge, although the company will do anti-static protection design on the main interface of the board when designing circuit board products, but it is difficult to do anti-static safety protection for all components and circuits. Therefore, it is recommended to follow esd safety precautions when handling any circuit board component. Esd protection measures include but are not limited to the following:

- During transportation or storage, place the card in an ESD bag and do not take it out until installation.
- Release the static electricity before touching the board. Wear a discharge grounding wrist strap.
- Operate the circuit board only in electrostatic discharge safety area.
- Avoid moving circuit boards in carpeted areas.
- Avoid direct contact with electronic components on the board by edge contact.

Table of Contents

Chapter 1. Introduction	1
1.1 Product Specifications	2
1.2 Order Information	3
1.3 Standing finish	3
Chapter 2. Interface Function Description	4
2.1 LED Indicators	4
2.2 Buttons	5
2.3 Functional Connector	5
Chapter 3. Installation and Use	6
3.1 Installation effect drawing	6
3.2 Method of use	7
3.3 Recovery mode	7
Chapter 4. Board card interface definition description	8
4.1 Core module interface [J1].....	8
4.2 Micro-USB2.0 [J2]	8
4.3 Fan interface [J12]	8
4.4 USB3.0 Connector [J3].....	9
4.5 RJ45 Ethernet Connector [J4].....	9
4.6 Micro SD Card Slot [J11]	9
4.7 HDMI Connector [J10]	10
4.8 Nano SIM card slot [J6].....	10
4.9 RTC Battery Holder[J19].....	10
4.10 Power Jack [J18]	11
4.11 MIPI Camera Connector [J8 & J9]	12
4.12 Output power supply connector [J14].....	12
4.13 miniPCIE Connector [J5 & J7].....	13
4.14 Multi-function IO extension interface [J17]	14
4.15 SPI and I2C Signal Extension Connector [J16].....	15

Chapter 1. Introduction

The Y-C6 is a low-cost, small-volume carrier board equipped with the NVIDIA® Jetson™ Xavier NX, TX2 NX, and Nano series of core modules, suitable for compact deployment requirements. For industrial deployment and application, the main interface for electrostatic safety protection design, using high reliability power application scheme, input power has overvoltage and antipolarity protection function, with rich external interface, the whole board devices are wide temperature model. In order to facilitate the shell structure design, the important interface design of Y-C6 load board is drawn out on one side, and the height limit design of the core module side is more convenient for the fan-less conduction and heat dissipation design.

The Y-C6 carrier board can be equipped with hundreds of functional modules through two miniPCIe connectors (including USB2.0 and PCIe X1 signals) to realize the further expansion of the system functions. It can expand 4 full speed USB3.0 signals, 4 gigabit network signals, 2 full speed SATA signals, and can also be equipped with up to 256G Mini PCIe storage, 4G communication module, video acquisition / output card of various formats, AD acquisition card, multi-serial port card, sound acquisition / output card, multi-function IO card...

1.1 Product Specifications

- 1 Full-speed USB3.1 Type A connector
- 1 Micro USB connector
- 1 Gigabit Ethernet (10 / 100 / 1000 BASE-T) RJ45 connector
- 1 HDMI 2.0 interface (up to 6Gbps, 24bpp, 4096x2160@60Hz)
- 1 Type CR1220 type RTC battery holder (without battery)
- 1 Work indicator light
- 1 fan control interface
- Lockable power terminal
- 1 micro TF card connector
- 1 Nano type SIM card connector
- 2 Full-length miniPCIe connectors
- 2 2 Lane MIPI camera interface FPC connectors
- The power is automatically turned on
- Onboard Reset, Recovery keys
- 1 CAN bus interface with on-board transceiver
- Two RS-232 level serial port, 13.3V level Debug serial port (UART)
- Three 3.3V bit programmable GPIO, one 3.3V strong driving ability of the bit programmable GPO
- One 3.3V level SPI signal and two 3.3V level I2C signal
- One 30pin 2.0mm spacing multi-function extension pin connector (including low-speed signals like GPIO, I2C, SPI, USB, RS-232)
- Card size: 120mm * 80mm * 18 mm
- Power supply requirements: DC + 9V~ + 24V
- Operating temperature: -40~ + 85°C
- Weight: 78g

* When used with the Jetson Nano module, the CAN bus interface function is not available, and the PCIe signal on 1 miniPCIe connector is not available.

1.2 Order Information

Model	Function
Y-C6	Interface expansion board with NVIDIA® Jetson™ Xavier NX, TX2 NX, Nano series core modules

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

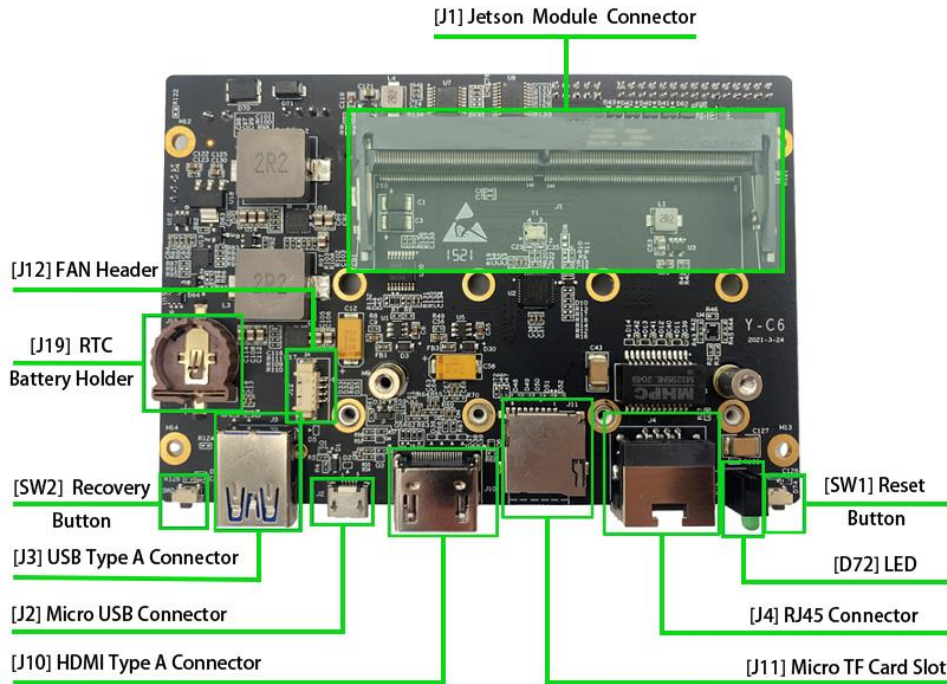
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1.3 Standing finish

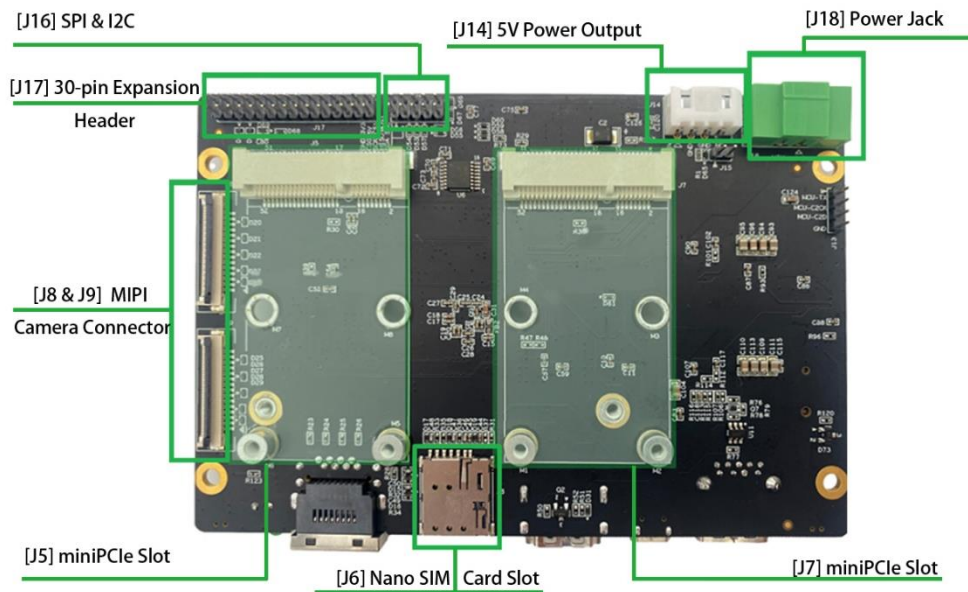
The Y-C6 fitting includes a 2.0mm spacing multifunctional pin connector (J17) outer lead line and a bag of screw packs. The screw package contains a screw pack and a power cord connector (male head) for fixing the load plate.



Chapter 2. Interface Function Description



Y-C6 Front Interface Description



Y-C6 Back Interface of Carrier Plate

2.1 LED Indicators

LED	Description
D72	SOC Regulator Power LED (Green)

2.2 Buttons

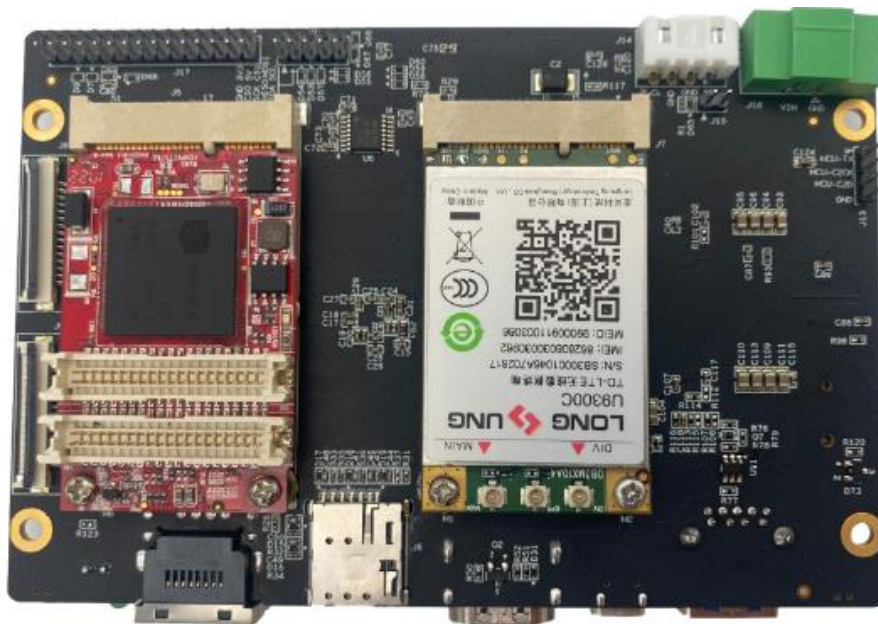
Button	Description	Usage
SW1	Reset button	Used to force a full system reset.
SW2	Recovery button	Used to enter Force Recovery Mode. Button is held down while either system is first powered on, or by pressing and releasing reset button while recovery button is pressed.

2.3 Functional Connector

Connector	Description
J1	High-speed connector for connecting the Jetson series of core modules
J2	Micro USB Connector, supporting Device mode only (including USB Recovery)
J3	USB 3.0 Type A Connector
J4	RJ45 Ethernet, RA, Female
J6	Nano SIM Card Slot
J5 & J7	miniPCIe Slot (52-pin)
J8 & J9	FPC-shaped 2 Lane mipi interface, CSI camera connector
J10	HDMI Type A Connector
J11	Micro TF Card Slot
J12	Fan-Header (4-pin)
J14	Provide 5V voltage output
J16	Extend 3.3V SPI and I2C signal (10pin)
J17	Multi-function pin connector (30pin)
J18	Power input terminal with locking function
J19	RTC Battery Socket

Chapter 3. Installation and Use

3.1 Installation effect drawing



3.2 Method of use

- 1) Ensure that the voltage for all external systems is turned off
- 2) Install the Jetson core module on the J1 high-speed connector. Note the alignment between the connectors. Install the core module retaining screws after the module is installed in place.
- 3) Install the necessary external cables. (Like: display line connected to HDMI display, power input line used to power the system, USB line linking keyboard and mouse, camera, miniPCIe function extension module...)
- 4) Connect the power cord to the power supply (see 4.4. Make sure that the heat sink on the core module is installed before charging.)
- 5) Y-C6 is set to automatically, power on and the system starts to work.
- 6) For systems without a protective housing, avoid moving the hardware system after electrification. Avoid using direct body contact with the circuit board and any electronic components.

3.3 Recovery mode

The Jetson core module works in normal mode and Recovery mode for file system update, kernel update, Boot loader update, BCT update and so on.

The steps to enter the Recovery mode are as follows:

- 1) Turn off the system power supply.
- 2) Use the Micro-USB cable to connect the Micro-USB port (J2) of the Y-C6 to the Jetson development host USB port.
- 3) Press the RECOVERY button (SW2) to power the system, press the SW2 button for more than 3 seconds, and then release the RECOVERY button.
- 4) The system enters the Recovery mode, where subsequent operations can be performed.

Chapter 4. Board card interface definition description

4.1 Core module interface [J1]

Function	Connect the NVIDIA Jetson Series Xavier NX / TX2 NX / Nano core module
Identification	J1
Type / Model	High-quality gold-plated high-speed connector
Pound definition	For the pin definitions of this connector, see the pin definition description in the NVIDIA Jetson Series Xavier NX / TX2 NX / Nano Core Module Data Manual.



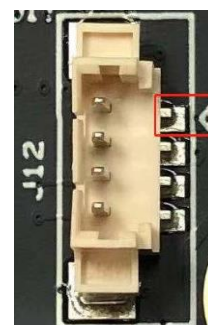
4.2 Micro-USB2.0 [J2]

Function	USB 2.0 Connector			
Identification	J2			
Type/Model	Type-B standard Micro USB 2.0 interface (for burning operating system)			
Pound definition	Pin	Signal	Pin	Signal
	1	VBUS	2	USB2.0DB
	3	USB2.0D+	4	USB ID
	5	GND		



4.3 Fan interface [J12]

Function	Connect the external cooling fan			
Identification	J12			
Type/Model	Molex PicoBlade Header 53261-0471			
Pound definition	Pin	Signal	Pin	Signal
	1	GND	2	+5V
	3	TACH	4	PWM
	Pin 1 position: marked in the red box on the right picture.			



4.4 USB3.0 Connector [J3]

Function	The USB3.0 Connector			
Identification	J3			
Type/Model	Type-A Standard USB3.0 Interface			
Pound definition	Pin	Signal	Pin	Signal
	1	VBUS	2	USB_D -
	3	USB_D +	4	GND
	5	SSRX -	6	SSRX +
	7	GND	8	SSTX -
	9	SSTX +		



4.5 RJ45 Ethernet Connector [J4]

Function	RJ45 Ethernet connector			
Identification	J4			
Type/Model	RJ45 Ethernet Socket, RA, Female			
Pound definition	Pin	Signal	Pin	Signal
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-
The network port supports 10/100/1000Mbps adaptive switching.				



4.6 Micro SD Card Slot [J11]

Function	Micro SD (TF) card slot			
Identification	J11			
Type/Model	Micro SD (TF)			
Pound definition	Pin	Signal	Pin	Signal
	1	SDIO_DATA2	2	SDIO_DATA3
	3	SDIO_CMD	4	SDIO_VCC
	5	SDIO_CLK	6	GND
	7	SDIO_DATA0	8	SDIO_DATA1
	9	GND	10	SDIO_CD



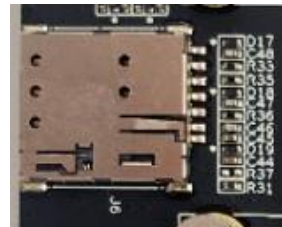
4.7 HDMI Connector [J10]

Function	The HDMI Display Connector			
Identification	J10			
Type/Model	Type A Standard HDMI Connectors			
Pound definition	Pin	Signal	Pin	Signal
	1	TMDS Data2+	2	TMDS Data2-
	3	TMDS Data2-	4	TMDS Data1+
	5	TMDS Data1-	6	TMDS Data1-
	7	TMDS Data0+	8	TMDS Data0-
	9	TMDS Data0-	10	TMDS Clock+
	11	TMDS Clock-	12	TMDS Clock-
	13	CEC	14	No Connect
	15	DDC clock	16	DDC data
	17	DDC GND	18	+5V Power
	19	Hot Plug		



4.8 Nano SIM card slot [J6]

Function	Nano SIM Card Slot			
Identification	J6			
Type/Model	Micro SIM			
Pound definition	Pin	Signal	Pin	Signal
	T1	SDIO_DATA2	T2	SDIO_DATA3
	T3	SDIO_CMD	T4	SDIO_VCC
	T5	SDIO_CLK	T6	GND
	T7	SDIO_DATA0	T8	SDIO_DATA1
	T9	SDIO_CD		



4.9 RTC Battery Holder[J19]

Function	RTC Battery Holder			
Identification	J19			
Type/Model	Type CR1220-button battery seat			
Pound definition	Pin	Signal	Pin	Signal
	1	VCC (3.3V)	2	GND

Pin 1 position: marked in the red box on the right picture.



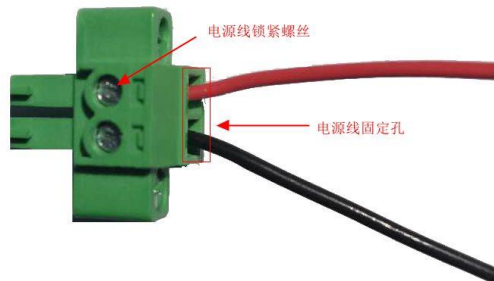
4.10 Power Jack [J18]

Function	Power supply input terminal			
Identification	J18			
Type/Model	The 3.5mm power supply terminals			
Pin definition	Pin	Signal	Pin	Signal
	1	VCC (+)	2	GND (-)

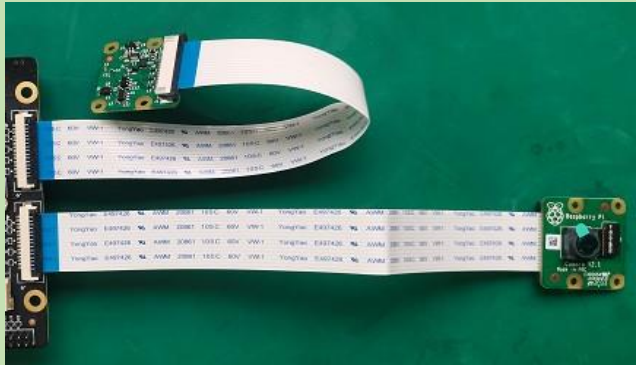
Pin 1 position: marked in the red box on the right picture.
Input voltage range: + 9V to + 24V.

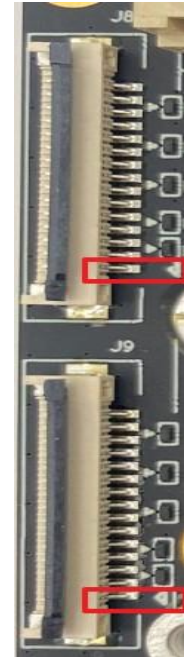
Power cord connection step:

1. Release the power cord lock screw for the power terminal (male) in the accessory bag
2. Insert the cable into the power cord fixing hole of the power supply terminal (male)
3. Tightening of power wire locking screw for power supply terminal (male) (note power line polarity)
4. Insert the male power terminal into the master power terminal on the card
5. Tighten the power supply terminal connector retaining screw



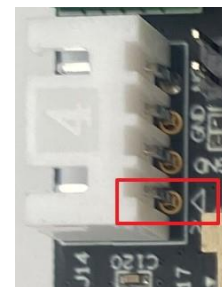
4.11 MIPI Camera Connector [J8 & J9]

Function	Mipi camera connector			
Identification	J8 & J9			
Type/Model	15pin, 1.0mm spacing, upper cover, lower contact FPC connector			
Pound definition	Pin	Signal	Pin	Signal
	1	VCC_3V3	2	I2C_SDA
	3	I2C_SCL	4	MCLK_1V8
	5	PWDN_1V8	6	GND
	7	CSI_CLK_P	8	CSI_CLK_N
	9	GND	10	CSI_D1_P
	11	CSI_D1_N	12	GND
	13	CSI_D0_P	14	CSI_D0_N
	15	GND		
	Pin 1 position: marked in the red box on the right picture.			
Connection diagram with Raspberry Pi 2 with MIPI camera				
				



4.12 Output power supply connector [J14]

Function	5V output, external power supply connector			
Identification	J14			
Type/Model	4 Pin, 2.54mm spacing connector XH-4AW			
Pound definition	Pin	Signal	Pin	signal
	1	5V	2	GND
	3	GND	4	NC
Pin 1 position: marked in the red box on the right picture.				
The interface can provide a maximum of 5V@3A power supply for peripherals.				



4.13 miniPCIE Connector [J5 & J7]

Function	The miniPCIE connector				
Identification	J5 & J7				
Type/Model	A miniPCIE connector with 5.6mm high support for full-length and half-length extension cards				
Pound definition	Pi	Signal	Pi	Signal	
	1	WAKE	2	3.3V	
	3	NC	4	GND	
	5	NC	6	1.5V	
	7	PEIC1_CLKREQ	8	UIM_PWR	
	9	GND	10	UIM_DATA	
	11	PEIC1_REFCLK	12	UIM_CLK	
	13	PEIC1_REFCLK	14	UIM_RESET	
	15	GND	16	UIM_VPP	
	17	NC	18	GND	
	19	NC	20	WI_DISABLE	
	21	PEIC_CARD_SE	22	PEIC1_REST	
	23	PERN	24	3.3V	
	25	PERP	26	GND	
	27	GND	28	1.5V	
	29	GND	30	SMB_CLK	
	31	PETN	32	SMB_DAT	
	33	PETP	34	GND	
	35	GND	36	CON_USB2_D_N	
	37	GND	38	CON_USB2_D_P	
	39	VCC_3V3_PCIE	40	GND	
	41	VCC_3V3_PCIE	42	NC	
	43	PEIC_SEL	44	NC	
	45	NC	46	NC	
	47	NC	48	1.5V	
	49	NC	50	GND	
	51	NC	52	3.3V	
	<p>Both the J5 and J7 connectors contain the USB2.0 and PCIe x1 signals</p> <p>The J5 connector + J6 (SIM seat) supports a 4G communication module without the SIM holder</p> <p>The J7 only supports 4G communication modules with its own SIM card seats</p> <p>The PCIe signal at the J7 connector position is not available with the Jetson Nano module</p>				



4.14 30-pin Extension Header [J17]

Function	Multi-function signal extension interface			
Identification	J17			
Type/Model	30-pin (2x15, 2.00mm pitch)			
Pound definition	Pin	Signal	Pin	Signal
	1	3.3V	2	5V
	3	GND	4	GND
	5	UART0_TX(RS-232)	6	UART0_RX(RS-232)
	7	UART1_TX(RS-232)	8	UART1_RX(RS-232)
	9	GND	10	GND
	11	CAN_L	12	CAN_H
	13	UART2_TX (TTL)	14	UART2_RX (TTL)
	15	GPO1	16	GPIO2
	17	GPIO3	18	GPIO4
	19	GND	20	GND
	21	I2C1_SCL (3.3V)	22	I2C1_SDA (3.3V)
	23	USB2_D3_P	24	USB2_D3_N
	25	USB2_D4_P	26	USB2_D4_N
	27	GND	28	GND
	29	3.3V	30	5V

The mapping file names of UART0 and UART1 in the system are shown in the following table:

Modules	Xavier NX	Nano	TX2 NX
UARTs			
UART0	/dev/ttyTHS1	/dev/ttyTHS2	/dev/ttyTHS1
UART1	/dev/ttyTHS0	/dev/ttyTHS1	/dev/ttyTHS2

UART2 is debugging serial port for kernel, used to output C-BOOT, U-Boot, Linux kernel information. Linux kernel is used as Linux terminal serial port. The default serial port setting is: 115,200 bps, 8N1

The resulting GPIO mapping numbers are shown in the following table. GPIO high level voltage is 3.3V. Among them, GPO1 can only be used as signal output IO, which can provide the current that can directly light the LED lamp bead.

GPIOs	Xavier NX		Nano	TX2 NX
	<Jetpack5.*	>=Jetpack5.*		
GPO1	436	453	216	396
GPIO2	422	441	200	306
GPIO3	268	321	194	338
GPIO4	393	419	38	269

Pin 1 position: marked in the red box on the right picture.



4.15 SPI and I2C Signal Extension Connector [J16]

Function	SPI and I2C Signal Extension Connector			
Identification	J16			
Type/Model	10-pin (2x5, 2.00mm pitch)			
Pound definition	Pin	Signal	Pin	Signal
	1	GND	2	VCC_3V3
	3	SPI0_CS0_3V3	4	VCC_5V
	5	SPI0_SCK_3V3	6	SPI0_CSI_3V3
	7	SPI0_MISO_3V3	8	SPI0_MOSI_3V3
	9	I2C0_SDA	10	I2C0_SCL
No welded pins on the board, pin1 position: the red box on the right.				

