

RTSO-6003L/LE

Reference Manual

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Revision History

Revision	Date	Reason for change	Applicable hardware version	Modifier
V1.0	2021-6	Initial release	V1.1	RT0086



Electronic components and circuits are very sensitive to electrostatic discharge. Although our company designs anti-static protection for the main interfaces on the card when designing circuit board products, it is difficult to achieve anti-static safety protection for all components and circuits. Therefore, it is recommended to observe anti-static safety precautions when handling any circuit board component (including RTSO-6003/E). Anti-static safety protection measures include, but are not limited to the following:

- a) The smart box should be placed in an anti-static bag during transportation and storage, and then the board should not be taken out during installation and deployment.
- b) Before touching the smart box, discharge the static electricity stored in the body: wear a discharge grounding wrist strap.
- c) Operate the smart box only within the safe area of the electrostatic discharge point.
- d) Avoid moving smart boxes in carpeted areas.

Precautions and after-sales maintenance

matters needing attention

Before using the product, please read this manual carefully and keep it for future reference:

- Please pay attention to and follow all warning and guidance information marked on the product;
- Please use matching power adapter to ensure the stability of voltage and current;
- Please use this product in a cool, dry and clean place;
- Do not use this product in cold and hot alternate environment to avoid condensation damage components;
- Do not splash any liquid on the product. Do not use organic solvent or corrosive liquid to clean the product;
- Do not use the product in dusty and messy environment. If it is not used for a long time, please pack the product;
- Do not use in the environment with excessive vibration, any dropping or knocking may damage the circuit and components;
- Do not plug and unplug the core board and peripheral modules when power is on;
- Please do not repair or disassemble the product by yourself. In case of any fault, please contact our company in time for maintenance;
- Do not modify or use unauthorized accessories by yourself, and the damage caused will not be warranted;

After sales maintenance

1) Warranty period

- Base plate, core plate : 3 year (non-human damage)
- Other peripherals sold by the company: 1 year (non-human damage)

2) Warranty description

- Within 7 days: the product (base plate, core module) is not damaged by human, our company will replace / repair it free of charge, and bear the return freight; (because the core module needs NVIDIA to confirm that it can meet the requirements of repair, it will take a long time, we will coordinate as soon as possible, please forgive for the inconvenience)
- From 7 days to 36 months: the product (base plate, core module) is not damaged by human, our company will repair it free of charge, and bear the return freight; (because the core module needs NVIDIA to confirm that it can meet the requirements of repair, it will take a long time, we will coordinate as soon as possible, please forgive for the inconvenience)
- Artificial damage in more than 3 year or 3 year: the product (carrier plate) shall be tested after it is sent to the customer, and the customer shall be informed of whether it can be repaired and the maintenance cost in detail. After reaching an agreement, the product shall be repaired and returned to the customer, and the company shall bear the return freight;
- Starting time: The core module is subject to the original factory delivery time, and the carrier board is subject to the express delivery date;

3) Contact information

Official website: www.realtimesai.com

Taobao website: <https://shop340963258.taobao.com/>

Address: 11, block B, Heping Xiyuan, Heping West Street, Chaoyang District, Beijing

Attention: RMA

Tel: 010-84284669

Mailing notice: contact with the company's sales department in advance, arrange technical support personnel to check and eliminate errors caused by misoperation as soon as possible, fill in the product after-sale return to factory maintenance form after verification, and send it to rma@realtimes.cn Mail box, please attach the list of items to facilitate verification, so as to avoid loss and loss in the process of express delivery. The company does not receive any delivery

Technical support and development customization

1. Scope of technical support

- 1) The electrical characteristics and application of the industrial boards and modules of the products released by the company;
- 2) Hardware physical size and related structure diagram and the definition of line sequence of specific interface;
- 3) Burn verification of all BSP support packages provided by the company;
- 4) The company released the burning environment construction, entry to use;
- 5) The company released a variety of peripheral module driver;
- 6) Fault diagnosis and after-sales service of the company's products;

2. Scope of technical discussion

Due to the wide range of embedded system knowledge and various types of involvement, we can not guarantee that all



kinds of questions can be answered one by one. The following content is not available for technical support, only suggestions can be provided.

- 1) Knowledge beyond the course published by our company;
- 2) Specific software program design;
- 3) Technical support for industrial carrier not issued by the company;
- 4) All kinds of driving support for industrial carrier board not issued by the company;
- 5) Hardware principle and drive design of peripheral module not issued by our company;

3. Technical support mode

- 1) Official website or email questions (recommended): <https://www.realtimesai.com/cn/download.html>
techsupport@realtimes.cn
- 2) Official Taobao through Alibaba Wangwang consultation: <https://shop340963258.taobao.com/>
- 3) Wechat group consultation (wechat Group No. consults Taobao customer service or sales, and Taobao purchase order No. needs to be provided for verification);
- 4) Technical support email: techsupport@realtimes.cn
- 5) Tel: 010-84284669

4. Technical support time

Monday to Friday; 8:30-12:00 am; 1:00-17:30 PM;

The company arranges the rest according to the national legal holidays, during which it may not be able to provide technical support, please send the problem to the technical support email. We will reply to you as soon as possible on weekdays.

5. Complaints and suggestions

If you are not satisfied with us or have suggestions, you can send an email to yu.qin@realtimes.cn For feedback, please call 010-84284669 for further improvement.

6. Customized development services

The company provides the embedded operating system driver based on NVIDIA Jetson series and the paid customized development service of hardware carrier board to shorten your product development cycle.

Please email the request to info@realtimes.cn

Data acquisition and subsequent update

1. Access to information

Download on our website

The company's website contains supporting information of its products, including product user manual, NVIDIA Jetson series module data manual, BSP driver support package for carrier board, supporting peripheral driver files, interface test verification method, FAQ, system burning guide, etc.get into www.realtimesai.com , select "data download" in the navigation bar, find the data you need, and click download.

2. Subsequent updates

Updates of subsequent documents, BSP, driver files and other official account will be updated in time. We will pay close attention to our developments in order to ensure that your information is up to date. We will push through WeChat public.



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1 Abstract

NVIDIA Jetson Nano/Xavier NX/TX2 NX module is a processor suitable for machine deep learning launched by NVIDIA. It has powerful computing power and the module area is only the size of a credit card. The RTSO-6003L/LE carrier board is for Nano/Xavier NX. /TX2 NX industrial-grade carrier board, rich in interfaces, low power consumption, high security level, can meet all kinds of harsh conditions. Provides the RTS-Linux4Tegra software support package for the new era of Ruitai; it is mainly aimed at the fast-growing artificial intelligence market in recent years, such as unmanned aerial vehicles and autonomous driving systems, which have relatively broad application prospects.

1.1 Features

- Compatible with Nvidia Jetson Nano/Xavier NX/TX2 NX modules
- 1x USB3.0 Type-A, support USB3.0 signal, Supply 1A output current
- 1x Micro USB2.0 OTG, support USB host and USB device mode, Supply 1A output current
- 1x Gigabit Ethernet (10/100/1000Mbps Adaptive; Native for Nano/Xavier NX interface)
- 4x Gigabit Ethernet (POE 802.3 af/at PSE)
- 1x RTC battery interface
- 1x HDMI 2.0 interface
- 1x Mini HDMI 2.0 interface
- 1x EMMC(128G)(6003LE)
- 1x TF card slot(6003L)
- 1x High speed connector (MIPI)
- 1x M.2 KEY M 2280 interface
- 1x M.2 KEY E 2230 interface
- 1x FAN interface
- 1x Isolated communication port (485, CAN, 4 x I/O)
- 1x Multi-function needle insertion
- Dimensions: 150mmx94mmx28mm
- Power Requirements: +12V
- Environmental: -20°C—+60°C
- Weight: 165g

1.2 Ordering Information

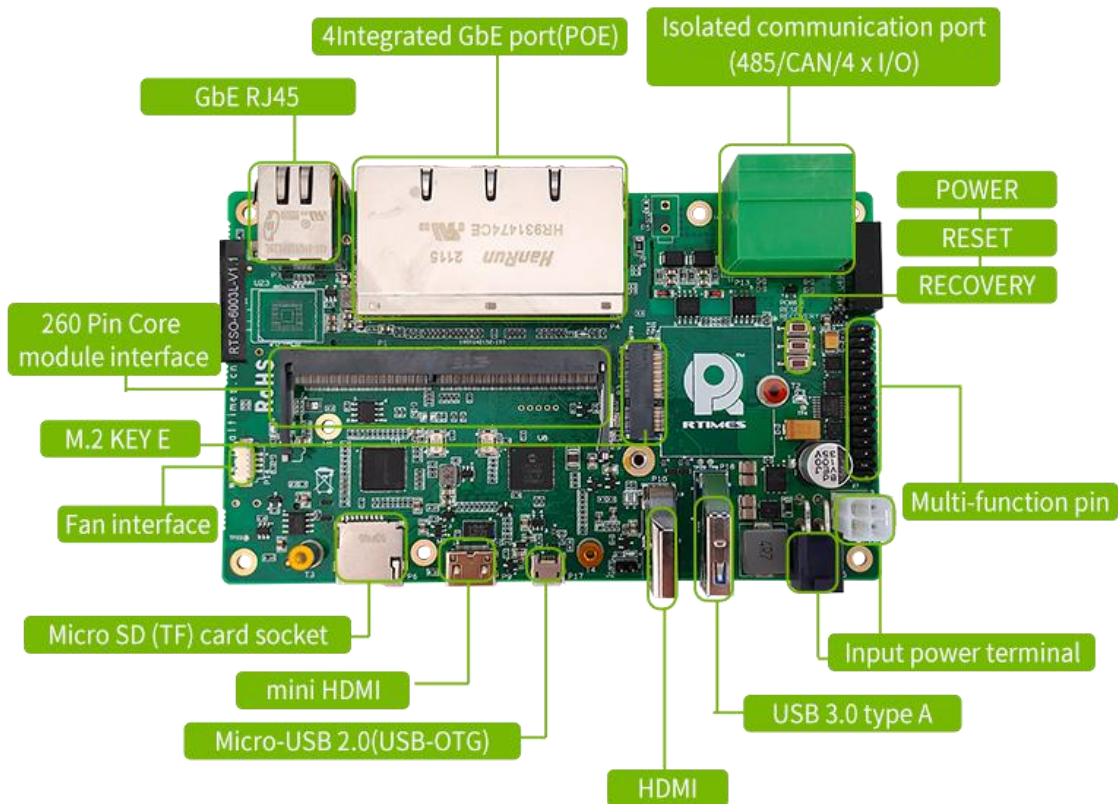
Model Options	Description
RTSO-6003L	Support NANO/XavierNX/TX2 NX module, 5 x GbE, 4 x GPIO (2 X isolated input, 2 X isolated output), 1 x RS-485 (isolation), 1 x CAN (isolation), 2 x UART (3.3V) , 2 x I2C (3.3V), 2 x SPI (3.3V), 1 x USB3.0, 1 x USB OTG, 1 x HDMI, 1 x Mini HDMI, 1 x microSD, 1 x M.2 KEY M, 1 x M.2 KEY E, providing Ruitai new era RTS Linux4Tegra software support package
RTSO-6003LE	Support NANO/XavierNX/TX2 NX module, 5 x GbE, 4 x GPIO (2 X isolated input, 2 X isolated output), 1 x RS-485 (isolation), 1 x CAN (isolation), 2 x UART (3.3V) , 2 x I2C (3.3V), 2 x SPI (3.3V), 1 x USB3.0, 1 x USB OTG, 1 x HDMI, 1 x Mini HDMI, 128GB eMMC, 1 x M.2 KEY M, 1 x M.2 KEY E, providing Ruitai new era RTS Linux4Tegra software support package
RTSV-6902 (Optional) RTSV-6904 (Optional)	M.2 video capture card, RTSV-6902 (dual-channel SDI video input), RTSV-6904 (four-channel SDI video input)

Order online

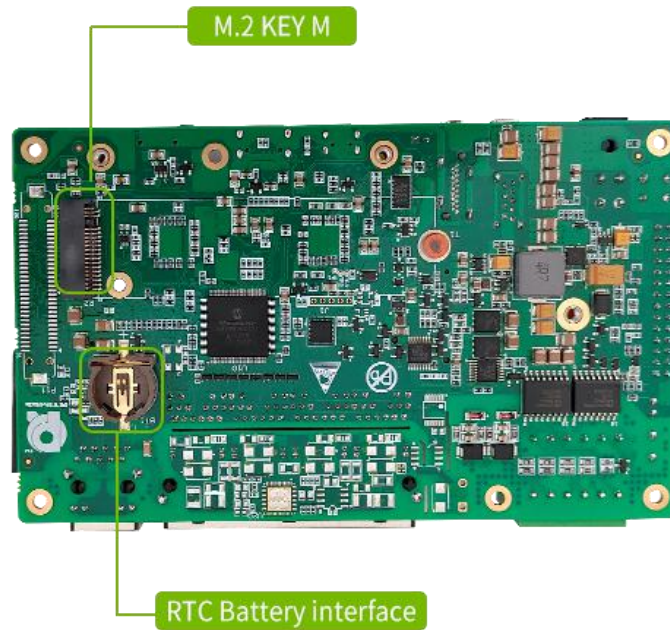
<https://shop340963258.taobao.com>

<https://mall.jd.com/index-824786.html>

2 Connector Locations



RTSO-6003L Top side



RTSO-6003L Bottom side

2.1 Functional connector

Mandatory Sign	Functional Description
P14	FAN interface
P1	260 Pin SO-DIMM, Used to connect to the NVIDIA Jetson Nano/Xavier NX/TX2 NX core module
BT1	RTC battery interface
P6	Micro SD (TF) card slot
P2	M.2 KEY M interface
P3	M.2 KEY E interface
P9	Mini HDMI Display interface
P17	Micro-USB 2.0 (USB-OTG) interface
P10	HDMI Display interface
P18	USB3.0 type A interface
P15,P16	Input power terminal
P12	Multi-function needle insertion
P13	Isolated communication port (485, CAN, 4x I/O)
P4	Four integrated gigabit network port(POE)
P7	RJ45 Gigabit Ethernet

2.2 LED

Mandatory Sign	Functional Description
D43	12V Power light
D14	POE Power light
D40	3.3V Power light
D2	M.2 KEY M working station indicator
D37	Indicator light for board running status
D3,D4	M.2 KEY E working station indicator

2.3 Buttons

Mandatory Sign	Functional Description
SW1	The POWER button is used for system shutdown and POWER on after soft shutdown
SW2	The RESET button is used to restart the core module
SW3	The RECOVERY button to enable the core module to enter recovery mode

3 Installation and use

3.1 picture of products



3.2 usage

Before using the RTSO-6003L/LE carrier board, you must confirm that the Jetson Nano/Xavier NX/TX2 NX core module is installed with the realtimes BSP operating system. For the installation of the operating system and jetpack, please refer to the [Jetson Nano/Xavier NX/TX2 NX system instruction manual](#) (Ruitai Cloud Disk/Help Document).

Power description:

RTSO-6003L/LE carrier board and Jetson Nano/Xavier NX/TX2 NX module equipment require +12V power supply. Connect the 12V power supply (optional) provided by Realtimes to the power socket [P15/P16] of the carrier board.

- a) Ensure that the voltage of all external systems is turned off
- b) Install the Nano/Xavier NX/TX2 NX core module on the 260 Pin SO-DIMM connector. Please pay attention to the alignment between the connectors during the installation process, and install the fixing screws at the same time.
- c) Install the necessary external cables. (Such as: the display cable connected to the HDMI monitor, the power input cable for supplying power to the system, the USB cable connecting the keyboard and mouse...)
- d) Connect the power cord to the power source.
- e) RTSO-6003L/LE adopts automatic/manual power-on design, turn on the power, and the system starts to work.
- f) For a system without a protective enclosure, after the system is powered on, please avoid moving the entire system, and it is strictly forbidden to touch the circuit board and its electronic components with your body.

Jetson Nano/Xavier NX/TX2 NX modules are designed to optimize power efficiency and support

multiple power modes. These power modes limit the power consumption of the module to around 5W or 10W or 15W by limiting the GPU and CPU frequency and the number of online CPU cores to a pre-approved level. For detailed information and settings of the power mode, you can view the help document [Jetson platform working mode settings and tegrastats status query](#).

3.3 Recovery Mode


Jetson Nano/Xavier NX/TX2 NX core module can work in normal mode and Recovery mode. File system update, kernel update, boot loader update, BCT update and other operations can be performed in Recovery mode.

The steps to enter the Recovery mode are as follows:


- a) Turn off the power supply to the system.
- b) Use USB cable to connect RTSO-6003L/LE's OTG-USB port (P17) with Jetson to develop host USB port.
- c) Press and hold the RECOVERY button to supply power to the system. The power supply should be maintained for more than 3 seconds, and then release the RECOVERY button.
- d) The system enters the Recovery mode, and subsequent operations can be carried out at this point.

4 Connectors Description


4.1 module interface

Function	Connect to the NVIDIA Jetson Nano/Xavier NX/TX2 NX core module	
Marking	P1	
Type	260 Pin SO-DIMM	
Pin define	For the pin definition of the connector, see the pin definition instructions in the NVIDIA Jetson Nano/Xavier NX/TX2 NX Core Module data Book.	


4.2 Fan interface

Function	Connect external cooling fan				
Marking	P14				
Type	Molex PicoBlade Header				
Pin define	Pin	Signal	Pin	Signal	
	1	GND	2	VDD5V	
	3	TACH	4	PWM	
Pin-1: the mark in the green box of the picture on the right.					

4.3 Micro SD card slot

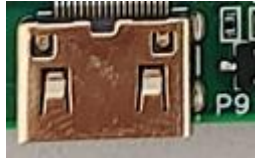
Function	Micro SD (TF) card slot				
Marking	P6				
Type	Micro SD (TF)				
Pin define	Pin	Signal	Pin	Signal	
	1	SD_D2	2	SD_D3/CD	
	3	SD_CMD	4	SD_VDD	
	5	SD_CLK	6	GND	
	7	SD_D0	8	SD_D1	
9	CD				

4.4 HDMI interface

Function	HDMI interface				
Marking	P10				
Type	HDMI				
Pin define	Pin	Signal	Pin	Signal	
	1	TMDS Data2+	2	TMDS Data2 shield	
	3	TMDS Data2-	4	TMDS Data1+	
	5	TMDS Data1 shield	6	TMDS Data1-	
	7	TMDS Data0+	8	TMDS Data0 shield	
	9	TMDS Data0-	10	TMDS Clock+	
	11	TMDS Clock shield	12	TMDS Clock-	
	13	CEC	14	Reserved	
	15	SCL	16	SDA	
	17	DDC/CEC_GND	18	+5V Power	
19	Hot Plug Detect				

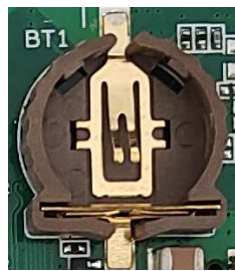
4.5 Mini HDMI interface

Function	HDMI interface			
Marking	P9			
Type	Mini HDMI			
Pin define	Pin		Signal	
	1	TMDS Data2 shield	2	TMDS Data2+
	3	TMDS Data2-	4	TMDS Data1 shield
	5	TMDS Data1+	6	TMDS Data1-
	7	TMDS Data0 shield	8	TMDS Data0+
	9	TMDS Data0-	10	TMDS Clock shield
	11	TMDS Clock+	12	TMDS Clock-
	13	DDC/CEC Ground	14	CEC
	15	SCL	16	SDA
	17	Reserved	18	+5V Power
	19	Hot Plug Detect		




4.6 RTC battery interface

Function	RTC battery holder			
Marking	BT1			
Type	Compatible with CR1220 battery			
Pin define	Pin		Signal	
	1	+	2	-



4.7 M.2 KEY E interface

Function	M.2 KEY E interface			
Marking	P3			
Type	M2 connector. Height 4.2mm			
Pin define	Pin		Signal	
	1	GND	2	3.3V
	3	USB_DP	4	3.3V
	5	USB_DM	6	LED#
	7	GND	8	PCM_CLK/12S SCK
	9	SDIO CLK	10	PCM_SYNC/12S WS





	11	SDIO CMD	12	AP_PCM_IN/12S SD_IN
	13	SDIO DATA0	14	AP_PCM_OUT/12S SD_OUT
	15	SDIO DATA1	16	LED2#
	17	SDIO DATA2	18	GND
	19	SDIO DATA3	20	UART_WAKE#
	21	SDIO WAKE#	22	AP_UART_RXD
	23	SDIO RESET#	32	AP_UART_TXD
	33	GND	34	AP_UART_CTS
	35	AP_PETP0	36	AP_UART_RTS
	37	AP_PETN0	38	VENDOR_DEFINED
	39	GND	40	VENDOR_DEFINED
	41	AP_PERP0	42	VENDOR_DEFINED
	43	AP_PERN0	44	COEX3
	45	GND	46	COEX2
	47	REFCLKP0	48	COEX1
	49	REFCLKN0	50	SUSCLK_32KHZ
	51	GND	52	PERST0#
	53	CLKREQ0#	54	W_DISABLE2#
	55	PEWAKE0#	56	W_DISABLE1#
	57	GND	58	I2C_DATA
	59	AP_RESERVED/PETP1	60	I2C_CLK
	61	AP_RESERVED/PETN1	62	ALERT#
	63	GND	64	RESERVED
	65	AP_RESERVED/PERP1	66	UIM_SWP/PERST1#
	67	AP_RESERVED/PERN1	68	UIM_POWER_SNK/CLK REQ1#
	69	GND	70	UIM_POWER_SRC/GPIO 1/PEWAKE1#
	71	RESERVED/REFCLKP1	72	3.3V
	73	RESERVED/REFCLKN1	74	3.3V
75	GND			


4.8 M.2 KEY M interface

Function	M.2 KEY M interface			
Marking	P2			
Type	M2 connector. Height 4.2mm			
Pin define	Pin		Signal	
	1	GND	2	3V3


3	GND	4	3V3
5	PER3_N	6	NC
7	PER3_P	8	NC
9	GND	10	LED
11	PET3_N	12	3V3
13	PET3_P	14	3V3
15	GND	16	3V3
17	PER2_N	18	3V3
19	PER2_P	20	NC
21	GND	22	NC
23	PET2_N	24	NC
25	PET2_P	26	NC
27	GND	28	NC
29	PER1_N	30	NC
31	PER1_P	32	NC
33	GND	34	NC
35	PET1_N	36	NC
37	PET1_P	38	NC
39	GND	40	SMB_CLK
41	PER0_N	42	SMB_DATA
43	PER0_P	44	ALERT*
45	GND	46	NC
47	PET0_N	48	NC
49	PET0_P	50	PERST#
51	GND	52	CLKREQ#
53	REFCLK_N	54	PEWAKE#
55	REFCLK_P	56	NC
57	GND	58	NC
67	NC	68	SUSCLK(32KHZ)
69	NC	70	3V3
71	GND	72	3V3
73	GND	74	3V3
75	GND		




4.9 Power input interface 1

Function	Power input terminal															
Marking	P16															
Type	Needle Connector-Through Hole-4-Position-0.165"(4.20mm)															
Pin define	<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>POWER_IN</td> <td>2</td> <td>POWER_IN</td> </tr> <tr> <td>3</td> <td>GND</td> <td>4</td> <td>GND</td> </tr> </tbody> </table> <p>Pin1: the place marked by the green box on the right Pin2: the place marked by the red box on the right</p>					Pin	Signal	Pin	Signal	1	POWER_IN	2	POWER_IN	3	GND	4
Pin	Signal	Pin	Signal													
1	POWER_IN	2	POWER_IN													
3	GND	4	GND													


4.10 Power input interface 2

Function	Power input terminal															
Marking	P15															
Type	Needle Connector-Through Hole-4-Position-0.165"(4.20mm)															
Pin define	<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>POWER_IN</td> <td>2</td> <td>POWER_IN</td> </tr> <tr> <td>3</td> <td>GND</td> <td>4</td> <td>GND</td> </tr> </tbody> </table> <p>Pin1: the place marked by the green box on the right Pin2: the place marked by the red box on the right</p>					Pin	Signal	Pin	Signal	1	POWER_IN	2	POWER_IN	3	GND	4
Pin	Signal	Pin	Signal													
1	POWER_IN	2	POWER_IN													
3	GND	4	GND													


4.11 Network interface

Function	Gigabit Ethernet connector																							
Marking	P7																							
Type	RJ45																							
Pin define	<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>					Pin	Signal	Pin	Signal	1	TP0+	2	TP0-	3	TP1+	4	TP2+	5	TP2-	6	TP1-	7	TP3+	8
Pin	Signal	Pin	Signal																					
1	TP0+	2	TP0-																					
3	TP1+	4	TP2+																					
5	TP2-	6	TP1-																					
7	TP3+	8	TP3-																					


4.12 4 Integrated front-end ports(POE)

Function	Four gigabit Ethernet connectors (POE)			
Marking	P4			
Type	4 x RJ45			
Pin define	Pin	Signal	Pin	Signal
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-
				

4.13 USB3.0 interface

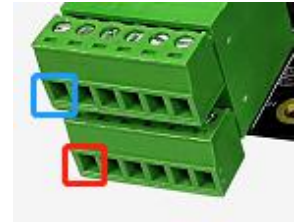
Function	USB3.0 interface			
Marking	P18			
Type	USB Type-A			
Pin define	Pin	Signal	Pin	Signal
	1	VBUS	2	D-
	3	D+	4	GND
	5	SSRX-	6	SSRX+
	7	GND	8	SSTX-
	9	SSTX+		
				

4.14 USB2.0 OTG

Function	Micro USB interface			
Marking	P17			
Type	Micro USB 2.0 Type-B			
Pin define	Pin	Signal	Pin	Signal
	1	VBUS	2	DN
	3	DP	4	ID
	5	GND		
				

4.15 Isolated communication port

Function	Isolated communication port (485, CAN, 4 x opto-isolator I/O)			
Marking	P13			
Type	Double row of bent pins at plate end 3.81mm			
Pin define	Pin	Signal	Pin	Signal
	1	RS485_A	2	IN1+
	3	RS485_B	4	IN1-
	5	CANH	6	IN2+
	7	CANL	8	IN2-
	9	OUT1+	10	OUT2+
	11	OUT1-	12	OUT2-
Pin1: the place marked by the blue box on the right. Pin2: the place marked by the red box on the right. The RS485 mapping file in the Linux system is ttyTHS1 in the /dev directory.				



4.16 Multi-function needle insertion

Function	Multi-function needle insertion			
Marking	P12			
Type	2.54mm pitch 2x14 Pin Dip			
Pin define	Pin	Signal	Pin	Signal
	1	VDD3V3_C	2	VDD5V_C
	3	UART2_TXD_3V3	4	UART2_RXD_3V3
	5	UART1_TXD1_3V3	6	UART1_RXD1_3V3
	7	GND	8	GND
	9	I2C0_SCL	10	I2C1_SCL
	11	I2C0_SDA	12	I2C1_SDA
	13	SPI0_SCK_3V3	14	SPI1_SCK_3V3
	15	SPI0_MISO_3V3	16	SPI1_MISO_3V3
	17	SPI0_MOSI_3V3	18	SPI1_MOSI_3V3
	19	SPI0_CS0_3V3	20	SPI1_CS0_3V3
	21	GPIO9_3V3	22	RESET_BTN_IN
	23	SPI0_CS1_3V3	24	RECOVERY_BTN_IN
	25	SPI1_CS1_3V3	26	POWER_BTN_IN
27	GND	28	GND	
Pin1: the place marked by the green box on the right. Pin2: the place marked by the red box on the right. The two serial ports UART1~UART2 lead out are both 3.3V TTL logic level.				



	<p>UART2 is the debug serial port. The mapping files of UART1 and UART2 in the Linux system are ttyTHS0 and ttyTCU0 in the /dev directory.</p> <p>The mapping files of SPI0 and SPI1 in the Linux system are spi0.0 and spi1.0 in the /dev directory.</p>	
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5 Hardware update history

RTSO-6003L/LE update history

Version	Reason for change
V1.1	Initial release

6 Product size





7 Software/BSP Details

When the RTSO-6003L/LE carrier board is working on a system burned with the official original version of NVIDIA Linux For Tegra (L4T). Some interfaces can be supported. But some interfaces cannot work normally.

RTSO-6003L/LE onboard interface full support, need to load the supporting driver patch.

NVIDIA LT4 package can be downloaded from the following link:

<https://developer.nvidia.com/embedded/linux-tegra>

RTSO-6003L/LE Driver patch support package download:

[http:// www.realtimesai.com/](http://www.realtimesai.com/)

Terms of Warranty

Important note

Each embedded product provided by Realtimes Technology is free from any defects in material and process, fully in line with the specifications officially issued by the original factory.

Realtimes Technology warranty covers the original products. If the parts configured by the dealer are out of order, please consult with the dealer to solve the problem. All the baseplate and core modules provided by Ruitai New Era (Beijing) Technology Co., Ltd. are guaranteed for 3 years, while the other peripherals are guaranteed for 1 year (life-long maintenance service is provided if the warranty period is beyond the warranty period). The warranty period starts from the date of delivery, for the products repaired within the warranty period, the repair parts shall be extended for 12 months. Unless notified by Realtimes Technology, the date of your original invoice shall be the date of shipment.

How do I get warranty services

If the product does not work properly, Please contact Realtimes Technology or dealer for warranty service, please show invoice when product warranty (this is the proof for you getting warranty service).

Warranty solution

When you ask for warranty service, please follow Realtimes Technology warranty process. You will need to receive your first diagnosis from a technical engineer by phone or by email, at that time, we need you to cooperate with us to fill in all the questions on the RMA form provided by us. Once we accurately determine the cause of the fault and the location of the damage, we will provide the charge list for the out of warranty products, which needs your confirmation. Realtimes Technology keep the right to repair or replace the products. If the product is replaced or repaired, the replaced faulty product or the repaired and replaced faulty parts will be returned to Realtimes Technology.

For products under warranty, the customer shall bear the freight when the product is returned to the manufacturer, Realtimes Technology will bear the ship cost of the products after maintenance.

The following conditions are not covered by the warranty terms

- a) Improper installation, improper use, misuse and abuse of products (Overloading, for example).
- b) Improper maintenance and storage (Such as fire, explosion, etc) or natural disasters (such as lightning stroke, earthquake, typhoon, etc)
- c) Personal unauthorized changing the product (such as changing circuit characteristics, mechanical characteristics, software characteristics, Conformal coating).
- d) Other failures which are clearly due to misuse (such as overvoltage, polarity reversal, the pin bent or broken, the wrong connection, drop damage, transportation damage, damage due to over operating temperature and so on).
- e) The logo and part number on the product have been deleted or removed.
- f) The product is out of warranty.

Special concerns

If the same fault multiple occurrence for the products, in order to find out the reason causing the problem, we will request the users to provide the specific documents or information of peripheral equipment, such as monitor, I/O boards, cables, power supply, diagram and structure of the system, etc. If such documents or information are not available, we have the right to refuse to perform the warranty, the repairs will be charged accordingly.