

# RTSO-6005

## Reference Manual

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## Revision History

Revision	Date	Reason for change	Applicable hardware version
V1.0	2020-11	Initial release	V1.0



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-6005). 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:1year(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;
- The starting time shall be subject to the date of express delivery receipt;

### 3) Contact information

Official website: [www.realtimesai.com](http://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](mailto: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 company releases the electrical characteristics and use of industrial carrier boards and modules;
- 2) Physical dimension of hardware, relevant structure diagram and line sequence definition of specific interface;
- 3) Burn in verification of all BSP support packages provided by the company;
- 4) The company released burn environment construction, entry-level use. ;
- 5) Various peripheral module drivers released by the company;
- 6) The company's product fault diagnosis and after-sales maintenance services;

### 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](mailto: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](mailto: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](http://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.



**Catalogue**

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## 1 Abstract

NVIDIA Jetson Nano/Xavier NX/TX2 NX are NVIDIA's deep learning processors with powerful computing power and modules the size of a credit card. Mainly aimed at the rapid development of artificial intelligence market in recent years, such as unmanned aerial vehicle, automatic driving system, etc., has a relatively broad application prospect. RTSO-6005 is an industrial-grade load plate for Nano/Xavier NX, operating temperature  $-40^{\circ}\text{C}$  --  $+80^{\circ}\text{C}$ , low power consumption, high security level, can meet all kinds of harsh conditions.

### 1.1 Features

- Compatible with nvidia Jetson Nano/Xavier NX/TX2 NX module
- 4x USB Type A , support usb2.0 and usb3.0 signal, 1.5A max output current
- 1x Micro USB, support usb host mode and usb device mode , 0.5A max output current
- 2x Gigabit Ethernet ( 10/100/1000Mbps Adaptive; Half duplex/full duplex adaptive; Native interface for Nano )
- 1x RTC battery interface
- 1x HDMI 2.0 (6Gbps, 24bpp, 4096x2160@60Hz)
- 1x M. 2-key-B interface, internal support USB3.1/PCIE signal switching, support 5G module
- 1x M. 2-key-E interface, supporting Bluetooth /WIFI modules
- 1x Card slot
- 1x SIM (Nano) card slot
- 1x SATA interface
- 1x SATA power interface,Support 12V/5V power supply
- 1x Fan control interface
- 1x Power light interface
- 1x Multi-function interface (internal support 2 x CAN, 2 x RS485, 4 x GPIO (3.3 V), 1 x Debug UART, 1 x Power\_Button,)
- Size: 127mm×49mm×30mm
- Power input: +12V/8A
- Temperature:  $-40\sim+80^{\circ}\text{C}$
- Weight: 108.4g

## 1.2 Ordering Information

Model Options	Description
RTSO-6005	Jetson NANO/Xavier NX/TX2 NX modules,2 x GbE,1 x M.2-KEY-B,1 x M.2-KEY-E,1 x HDMI,1 x USB OTG, 4 x USB 3.0/USB3.1 ,1 x Debug UART, 5G module (optional),1 x SATA ,1 x Micro SIM,1 x Micro SD,2 x CAN,2 x RS485,4 x GPIO(3.3V),Ruitai New Era RTSO-6005 Linux4Tegra software support package
M.2 Video capture card (optional)	RTSV-6902 (dual-channel SDI video input), RTSV-6904 (four-channel SDI Video input)

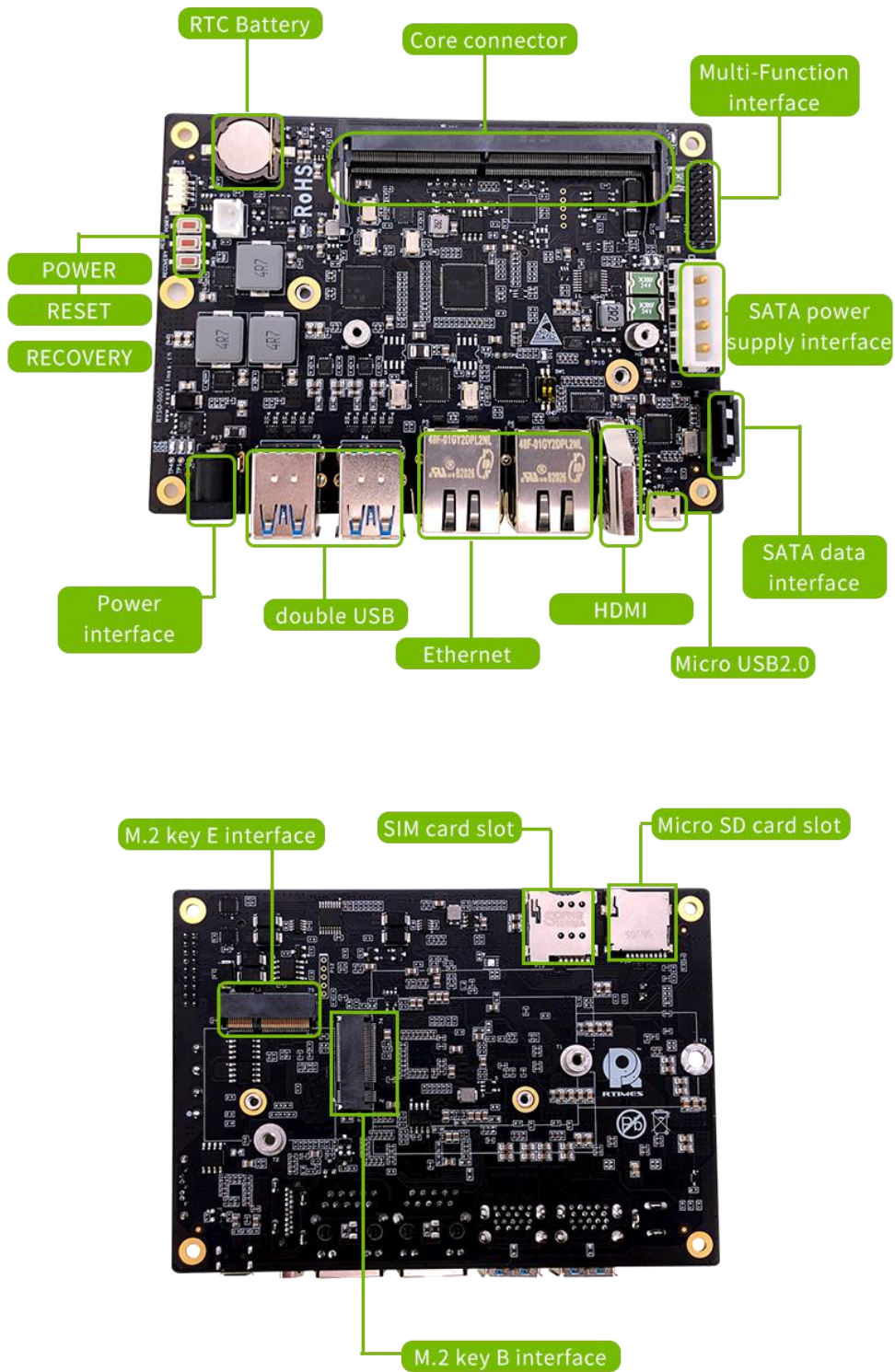
### Order online

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

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



## 2 Connector Locations



## 2.1 Functional connector

Marking	Function description
P1	260 Pin,Connect to the NVIDIA Jetson NANO/Xavier NX/TX2 NX core module
P2	Micro-USB 2.0 (USB-OTG) interface
P3,P4	Double layer USB Type A connector
P5.P6	RJ45 wired network signal connector
P7	HDMI display interface
P8	STAT interface
P9	STAT Power interface
P10	M.2-KEY-B interface
P11	M.2-KEY-E interface
P12	Internal retention interface
P13	FAN interface
P14	Micro SD (TF) card slot
P15	Micro SIM card slot
P16	Multi-function interface
P17	Power interface

## 2.2 LED indicator light

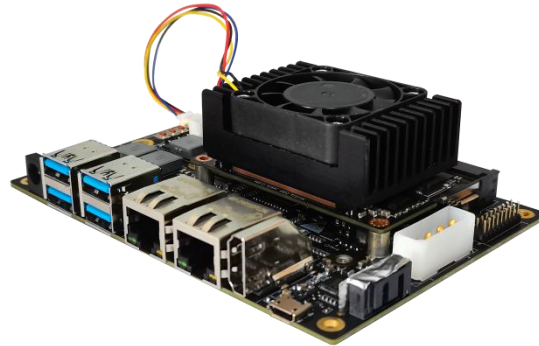
Marking	Function description
D14	Indicator light for operating status of equipment system

## 2.3 Button

Marking	Function description
SW1	Selector switch used to switch the PCIE/USB3.0 bus of the M.2 KEY B interface
SW2	POWER button is used for system shutdown and POWER on after soft shutdown
SW3	RECOVERY button is used to put the core module into recovery mode
SW4	RESET button is used to restart the core module

## 3 Installation and use

### 3.1 picture of products



### 3.2 usage

- a) Ensure that all external system voltages are switched off
- b) Install the Nano/Xavier NX/TX2 NX core module on the 260 Pin SO-Dimm connector. Pay attention to the alignment between the connectors during the installation, apply even force, and install the fixing screws.
- c) Install necessary external cables. (e.g., the display cable to the HDMI display, the power input cable to power the system, the USB cable to link the keyboard and mouse...)
- d) Connect the power cord to the power supply.
- e) RTSO-6005 adopts automatic/manual power on design, turn on the power and the system starts to work.
- f) For the system without protective enclosure, please avoid moving the whole system after the system is powered on. It is strictly prohibited to use the body to touch the circuit board and its electronic components.

### 3.3 Recovery MODE


Jetson Nano/Xavier NX/TX2 NX core module can work in normal mode and Recovery mode, under which file system update, kernel update, Boot Loader update, BCT update and other operations can be performed.

The steps to enter the Recovery mode are as follows:


- a) Power down the device.
- b) Use USB cable to connect THE OTG-USB port of RTSO-6005 (P2) with the USB port of Jetson to develop the host.
- c) Press the RECOVERY button without releasing it to power the system. The power supply should be maintained for more than 3 seconds, and then release the RECOVERY button.
- d) After the system enters the Recovery mode, subsequent operations can be carried out.

## 4 Connectors Description

### 4.1 module interface

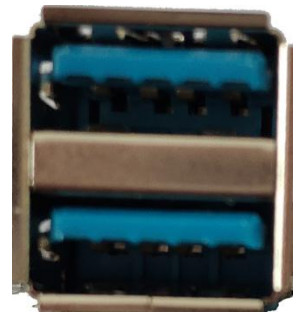
<b>Function</b>	Connect NVIDIA Jetson Nano/Xavier NX/TX2 NX core module	
<b>Marking</b>	P1	
<b>Type</b>	260 Pin DDR4 SO-DIMM	
<b>Pin define</b>	Refer to the pin definition instructions in the NVIDIA Jetson Nano/Xavier NX/TX2 NX core module data book.	

### 4.2 Micro USB interface

<b>Function</b>	Micro USB connector																			
<b>Marking</b>	P2																			
<b>Type</b>	Molex PicoBlade Header																			
<b>Pin define</b>	<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>USB 2.0 D-</td> </tr> <tr> <td>3</td> <td>USB 2.0 D+</td> <td>4</td> <td>USB ID</td> </tr> <tr> <td>5</td> <td>GND</td> <td></td> <td></td> </tr> </tbody> </table>	Pin	Signal	Pin		Signal	1	VBUS	2	USB 2.0 D-	3	USB 2.0 D+	4	USB ID	5	GND				
Pin	Signal	Pin	Signal																	
1	VBUS	2	USB 2.0 D-																	
3	USB 2.0 D+	4	USB ID																	
5	GND																			

### 4.3 USB3.0 interface

<b>Function</b>	USB connector			
<b>Marking</b>	P3			
<b>Type</b>	Dual USB Type-a interface			
<b>Pin define</b>	<b>Level</b>		<b>Superstratum</b>	
	<b>Type</b>		<b>USB 3.0 And USB 2.0</b>	
	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	1	VBUS	2	USB 2.0 D-
	3	USB 2.0 D+	4	GND
	5	SSRX-	6	SSRX+
	7	GND	8	SSTX-
	9	SSTX+		
	Note: When the core module is Xavier NX, the upper USB interface is USB3.1			
	<b>Level</b>		<b>Substratum</b>	
<b>Level</b>		<b>USB 2.0</b>		
<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>	
1	VBUS	2	USB 2.0 D-	
3	USB 2.0 D+	4	GND	
5	SSRX-	6	SSRX+	
7	GND	8	SSTX-	
9	SSTX+			
The lower USB2.0 enabling depends on the dial code switch J3 having 1 at the OFF bit				



### 4.4 USB3.0 interface

<b>Function</b>	USB connector			
<b>Marking</b>	P4			
<b>Type</b>	Dual USB Type-a interface			




<b>Pin define</b>	<b>Level</b>	<b>Superstratum</b>			
	<b>Type</b>	<b>USB 3.0 And USB 2.0</b>			
	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>	
	1	VBUS	2	USB 2.0 D-	
	3	USB 2.0 D+	4	GND	
	5	SSRX-	6	SSRX+	
	7	GND	8	SSTX-	
	9	SSTX+			
	Note: When the core module is Xavier NX, the upper USB interface is USB3.1				
	<b>Level</b>	<b>Substratum</b>			
<b>Level</b>	<b>USB 2.0</b>				
<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>		
1	VBUS	2	USB 2.0 D-		
3	USB 2.0 D+	4	GND		
5	SSRX-	6	SSRX+		
7	GND	8	SSTX-		
9	SSTX+				
The lower USB2.0 enabling depends on the dial code switch J3 having 1 at the OFF bit					

### 4.5 Gigabit Ethernet interface


<b>Function</b>	Ethernet connector			
<b>Marking</b>	P5			
<b>Type</b>	RJ45			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-




## 4.6 Gigabit Ethernet interface

<b>Function</b>	Ethernet connector			
<b>Marking</b>	P6			
<b>Type</b>	RJ45			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-
				


## 4.7 HDMI display interface

<b>Function</b>	DHMI display connector				
<b>Marking</b>	P7				
<b>Type</b>	HDMI				
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>	
	1	TMDS Data2+	2	TMDS Data2 GND	
	3	TMDS Data2-	4	TMDS Data1+	
	5	TMDS Data1 GND	6	TMDS Data1-	
	7	TMDS Data0+	8	TMDS Data0 GND	
	9	TMDS Data0-	10	TMDS Clock+	
	11	TMDS Clock GND	12	TMDS Clock-	
	13	CEC	14	No Connect	
	15	DDC clock	16	DDC data	
	17	DDC GND	18	+5V Power	
	19	Hot Plug Detect			
					

### 4.8 SATA interface

<b>Function</b>	SATA connector																	
<b>Marking</b>	P8																	
<b>Type</b>	SATA																	
<b>Pin define</b>	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> </tr> <tr> <td>2</td> <td>TX_P</td> </tr> <tr> <td>3</td> <td>TX_N</td> </tr> <tr> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>RX_P</td> </tr> <tr> <td>6</td> <td>RX_N</td> </tr> <tr> <td>7</td> <td>GND</td> </tr> </tbody> </table>	Pin		Signal	1	GND	2	TX_P	3	TX_N	4	GND	5	RX_P	6	RX_N	7	GND
Pin	Signal																	
1	GND																	
2	TX_P																	
3	TX_N																	
4	GND																	
5	RX_P																	
6	RX_N																	
7	GND																	

### 4.9 SATA Power interface

<b>Function</b>	SATA Power											
<b>Marking</b>	P9											
<b>Type</b>												
<b>Pin define</b>	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> </tr> <tr> <td>2</td> <td>+5V</td> </tr> <tr> <td>3</td> <td>GND</td> </tr> <tr> <td>4</td> <td>+12V</td> </tr> </tbody> </table>	Pin		Signal	1	GND	2	+5V	3	GND	4	+12V
Pin	Signal											
1	GND											
2	+5V											
3	GND											
4	+12V											



## 4.10 M.2-KEY-B interface

<b>Function</b>	M.2-KEY-B slot			
<b>Marking</b>	P10			
<b>Type</b>	M.2-KEY-B			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	2	3.3V	1	NC
	4	3.3V	3	GND
	6	Full_Card_Power	5	GND
	8	W_DISABLE1	7	USB_DP
	10	GPIO9	9	USB_DN
	12	NC	11	GND
	14	NC	13	NC
	16	NC	15	NC
	18	NC	17	NC
	20	NC	19	NC
	22	NC	21	NC
	24	NC	23	WANKE_ON
	26	NC	25	NC
	28	NC	27	GND
	30	UIM1_RESET	29	PET1_N/USB3.0_RX_N
	32	UIM1_CLK	31	PET1_P/USB3.0_RX_P
	34	UIM1_DATA	33	GND
	36	UIM1_PWR	35	PER1_N/USB3.0_TX_N
	38	NC	37	PER1_P/USB3.0_TX_P
	40	NC	39	GND
	42	NC	41	DPCIE0_RX0_N
	44	NC	43	DPCIE0_RX0_P
	46	NC	45	GND
	48	NC	47	DPCIE0_TX0_N
	50	PCIE_RESET	49	DPCIE0_TX0_P
	52	PCIE_CLK_REQ	51	GND
	54	PCIE_WAKE	53	DPCIE0_CLK_N
	56	NC	55	DPCIE0_CLK_P
	58	NC	57	GND
60	NC	59	NC	
62	NC	61	NC	
64	NC	63	NC	
66	UIM1_DETECE	65	NC	
68	CLK_32K	67	RESET	
70	GND	69	NC	



	72	GND	71	GND
	74	GND	73	NC
	76	GND	75	NC

#### 4.11 M.2-KEY-E interface

<b>Function</b>	USB2.0			
<b>Marking</b>	P11			
<b>Type</b>	M.2-KEY-E			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	2	3.3V	1	GND
	4	3.3V	3	USB_DP
	6	LED1	5	USB_DN
	8	I2S1_SCLK	7	GND
	10	I2S1_LRCK	9	NC
	12	I2S1_DIN	11	NC
	14	I2S1_DOUT	13	NC
	16	M.2_KEY_E_LED2	15	NC
	18	GND	17	NC
	20	M2_KEY_E_WAKE	19	NC
	22	UART1_RXD2	21	NC
	24	NC	23	NC
	26	NC	25	NC
	28	NC	27	NC
	30	NC	29	NC
	32	UART1_TXD2	31	NC
	34	UART1_CTS	33	GND
	36	UART1_RTS2	35	PER1_N/USB3.0_TX_N
	38	NC	37	PER1_P/USB3.0_TX_P
	40	NC	39	GND
	42	NC	41	DPCIE0_RX0_N
	44	NC	43	DPCIE0_RX0_P
	46	NC	45	GND
	48	NC	47	DPCIE0_TX0_N
	50	CLK_32K_OUT	49	DPCIE0_TX0_P
	52	PCIE_RESET	51	GND
	54	BT_RST_KEY_E#	53	DPCIE0_CLK_N
	56	WIFI_DISABLE1	55	DPCIE0_CLK_P
	58	I2C1_SDA	57	GND
	60	I2C1_SCL	59	NC




	62	GPIO10_SMB_ALERT	61	NC
	64	NC	63	NC
	66	NC	65	NC
	68	NC	67	RESET
	70	NC	69	NC
	72	3.3V	71	GND
	74	3.3V	73	NC
			75	NC


#### 4.12 Internal retention interface

<b>Function</b>	Internal retention interface	
<b>Marking</b>	P12	
<b>Type</b>		
<b>Pin define</b>		

#### 4.13 FAN interface

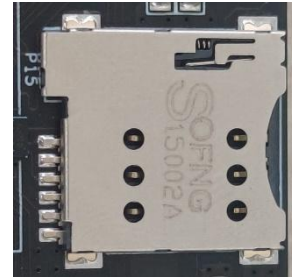
<b>Function</b>	Connect external cooling fan												
<b>Marking</b>	P13												
<b>Type</b>	Molex PicoBlade Header												
<b>Pin define</b>	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> <td>2</td> <td>+5V</td> </tr> <tr> <td>3</td> <td>TACH</td> <td>4</td> <td>PWM</td> </tr> </tbody> </table> <p>Pin 1 position: green box on the right side.</p>		Pin	Signal	Pin	Signal	1	GND	2	+5V	3	TACH	4
Pin	Signal	Pin	Signal										
1	GND	2	+5V										
3	TACH	4	PWM										

#### 4.14 Micro SD (TF) card slot

<b>Function</b>	Micro SD (TF) card slot																								
<b>Marking</b>	P14																								
<b>Type</b>	Micro SD (TF)																								
<b>Pin define</b>	<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>SDIO_DATA2</td> <td>2</td> <td>SDIO_DATA3</td> </tr> <tr> <td>3</td> <td>SDIO_CMD</td> <td>4</td> <td>SDIO_VCC</td> </tr> <tr> <td>5</td> <td>SDIO_CLK</td> <td>6</td> <td>GND</td> </tr> <tr> <td>7</td> <td>SDIO_DATA0</td> <td>8</td> <td>SDIO_DATA1</td> </tr> <tr> <td>9</td> <td>GND</td> <td>10</td> <td>SDIO_CD</td> </tr> </tbody> </table>		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
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																						

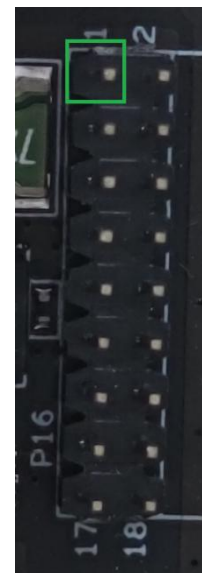
### 4.15 Micro SIM card slot

<b>Function</b>	SIM card slot			
<b>Marking</b>	P15			
<b>Type</b>	Micro SIM			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	S1	UIM_PWR	S2	UIM_RESET
	S3	UIM_CLK	S4	NC
	S5	GND	S6	NC
	S7	UIM_DATA		
	SIM card facing: notch facing outward			




### 4.16 Multi-function interface


<b>Function</b>	Multi-function interface			
<b>Marking</b>	P16			
<b>Type</b>	2.0mm spacing 2x9Pin double row straight needle insertion			
<b>Pin define</b>	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
	1	5V	2	5V
	3	CAN0_H	4	CAN1_H
	5	CAN0_L	6	CAN1_L
	7	1_RS485_B	8	2_RS485_B
	9	1_RS485_A	10	2_RS485_A
	11	GPIO3	12	GPIO1
	13	GPIO4	14	GPIO2
	15	Debug_UART_TXD	16	Debug_UART_RXD
	17	GND	18	POWER_BTN_IN_MCU
<p>Position of pin 1: Mark in the red box of the picture on the right.                  Pin 2 position: green box on the right.</p> <p>Insertion location: the blue box on the right.</p> <p>The resulting UART1 serial port is 3.3V TTL logic level.                  UART1 is for debugging serial ports.</p> <p>The mapping file in the Linux system is ttyS0 in the /dev directory.</p> <p>The derived GEN1_I2C and GEN2_I2C buses correspond to iIC-1 and IIC-0 buses in the Linux system.</p>				



### 4.17 Power interface

<b>Function</b>	Power interface											
<b>Marking</b>	P17											
<b>Type</b>	12V power input interface											
<b>Pin define</b>	<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>VCC (+)</td> <td>2</td> <td>GND (-)</td> </tr> </tbody> </table> <p>Pin 1 position: green box on the right side.</p> <p>Input voltage range: single +12V</p> <p><b>Cable connection is strictly prohibited!</b></p>					Pin	Signal	Pin	Signal	1	VCC (+)	2
Pin	Signal	Pin	Signal									
1	VCC (+)	2	GND (-)									

### 4.18 SW1 dial switch

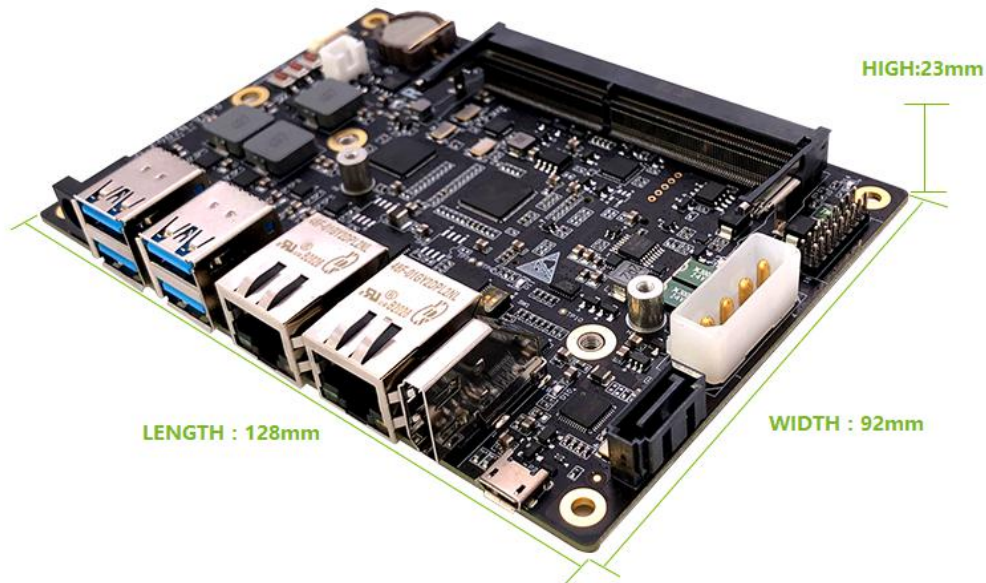
<b>Function</b>	Dial switch															
<b>Type</b>	Two multi - function dial - code switch															
<b>Pin define</b>	<b>Marking: J3</b> <table border="1"> <thead> <tr> <th>Dial-up switch</th> <th>Status</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td rowspan="2">BIT1</td> <td>OFF</td> <td>NC</td> </tr> <tr> <td>ON</td> <td>PCIE Signal</td> </tr> <tr> <td rowspan="2">BIT2</td> <td>OFF</td> <td>NC</td> </tr> <tr> <td>ON</td> <td>USB3.0 Signal</td> </tr> </tbody> </table>				Dial-up switch	Status	Function	BIT1	OFF	NC	ON	PCIE Signal	BIT2	OFF	NC	ON
Dial-up switch	Status	Function														
BIT1	OFF	NC														
	ON	PCIE Signal														
BIT2	OFF	NC														
	ON	USB3.0 Signal														

## 5 Hardware update history

### RTSO-6005 update history

Version	Reason for change
V1.0	Initial release

## 6 Product size



## 7 Software/BSP Details

RTSO-6005 boards work on systems that are burned using the official original NVIDIA Linux For Tegra (L4T). HDMI, Gigabit Ethernet, USB2.0, serial port, GPIO, I2C bus, fan interface, upper LAYER USB3.0 can be supported.

RTSO-6005 onboard interface full support, need to load the supporting driver patch.

The NVIDIA Original LT4 package can be downloaded from the following link:

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

RTSO-6005 Driver Patch Support Package Download address:

[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 repairments will be charged accordingly.

Rev.C 6/2020