

# Purple Pi R1 Motherboard Specifications



## Purple Pi R1 Motherboard Specifications

ShenZhen Tactile Intelligent Technology Co.,Ltd  
[www.industio.cn](http://www.industio.cn)

### 1、Product description

#### 1.1 Product description

Purple Pi R1 motherboard is a development board based on SigmaStar SSD201 SoC (ARM Cortex A7 core) compatible with Raspberry Pi, with a main frequency of up to 1.2GHz, 256KB L2-cache, built-in dual MAC, a PHY, and supports dual 100M Ethernet interfaces. Memory management supports DMA engine. Integrated H.264/AVC and H.265/HEVC decoder, supports maximum resolution FHD (1920x1080)/60 frame decoding.

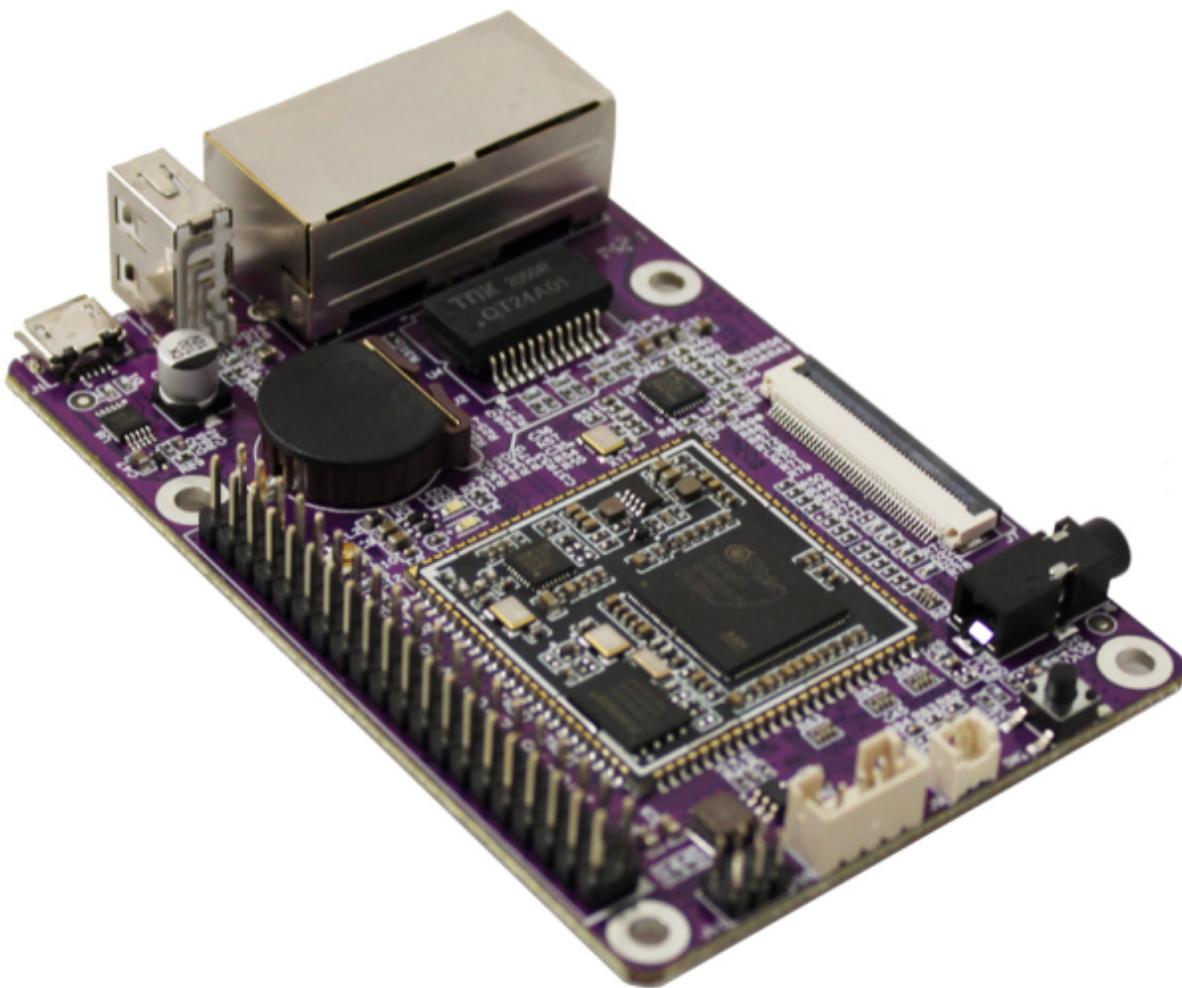


Figure 1. Purple Pi R1 product schematic

Purple Pi R1 motherboard supports TF card holder, dual 10/100Mbps Ethernet, audio interface, USB2.0, MIPI-DSI screen interface and single-band WIFI. Mainly used in smart building indoor unit, smart home central control, 86-box home central control, elevator floor display, IP network broadcasting equipment and voice recognition equipment, etc.

## 1.2 Product appearance and size

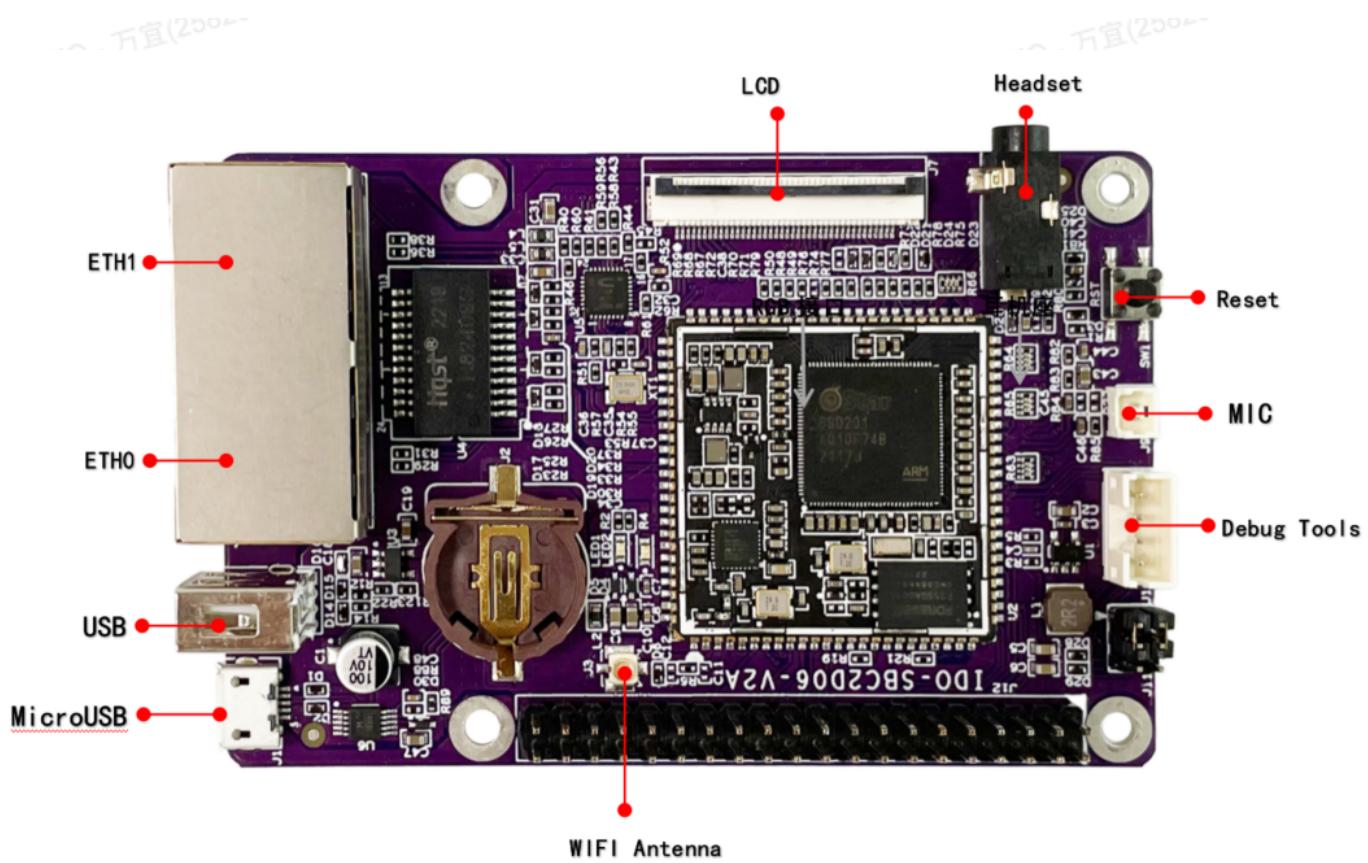


Figure 2. Purple Pi R1 front interface diagram

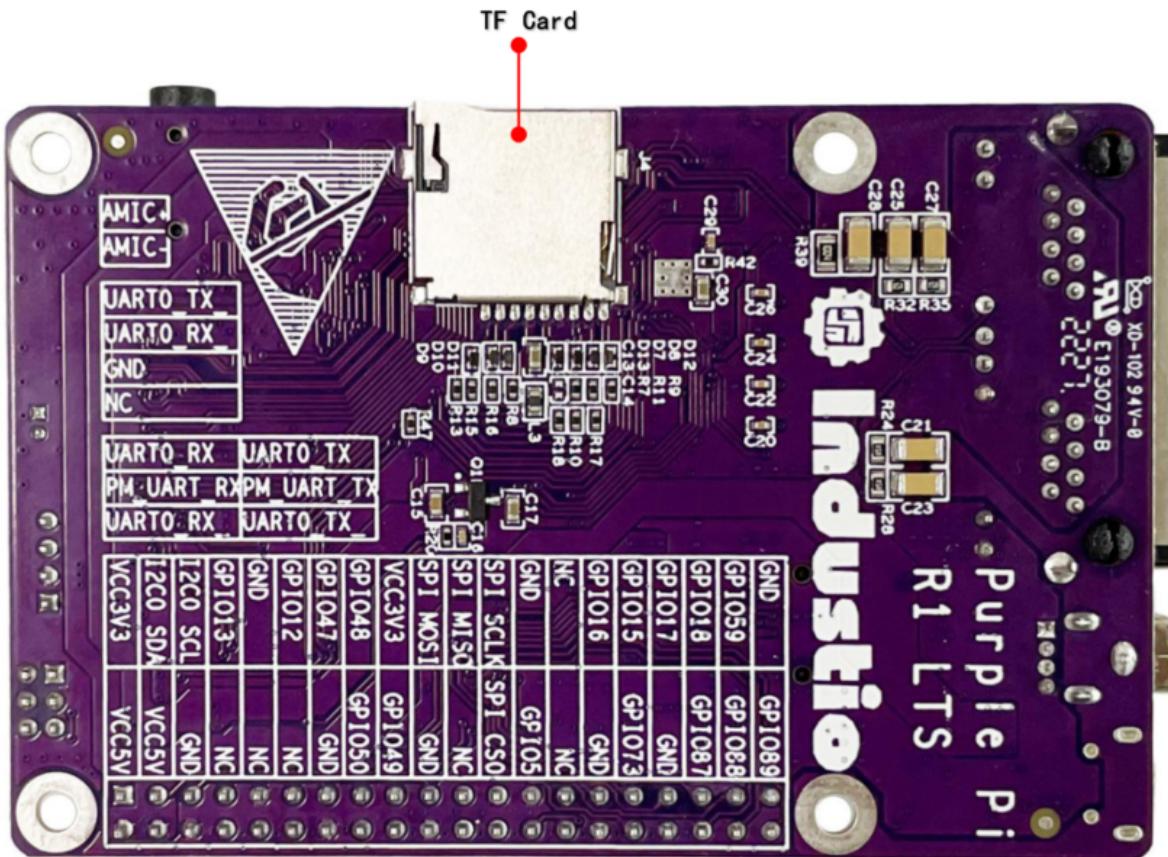


Figure 3. Purple Pi R1 reverse interface diagram

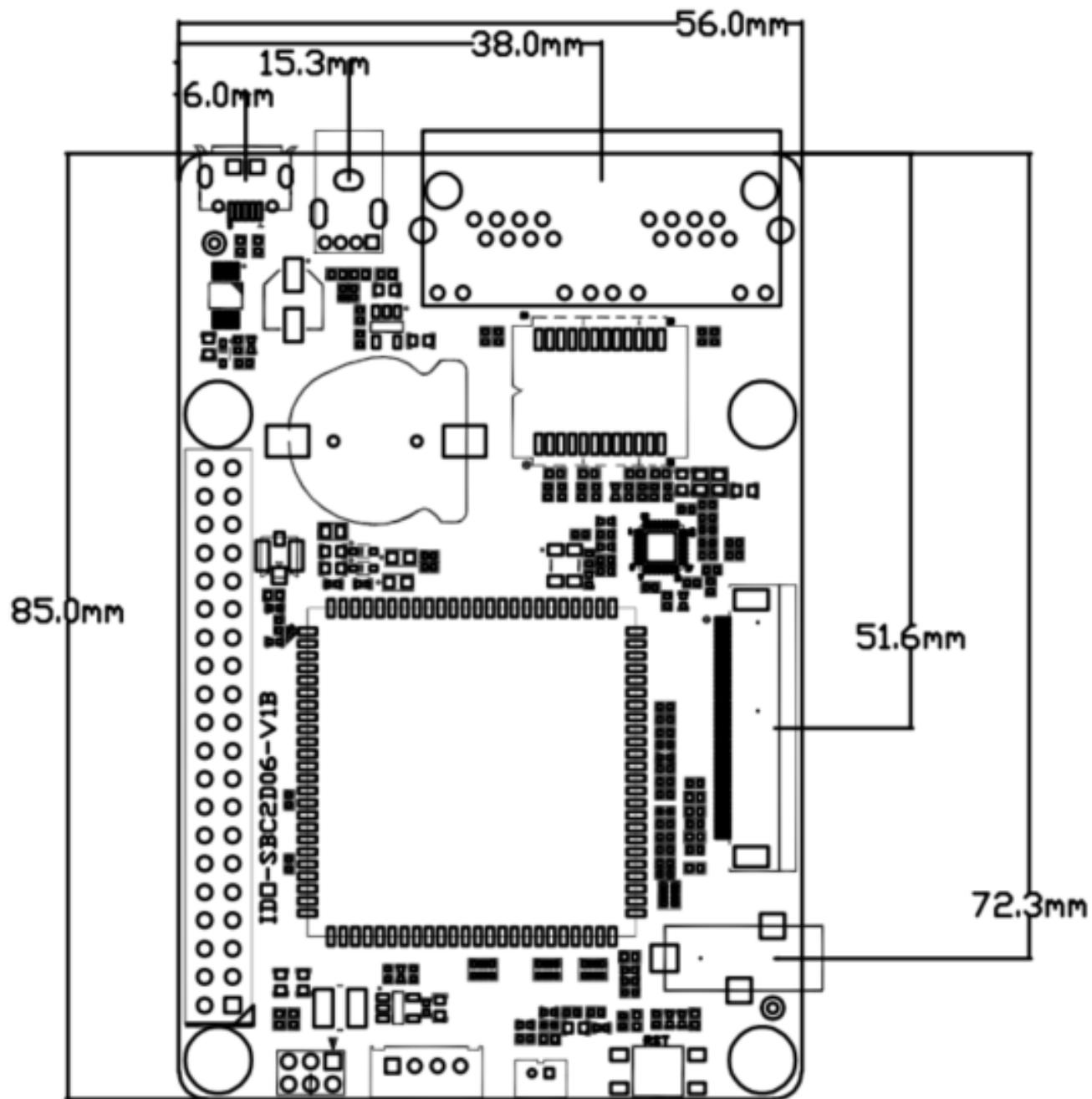


Figure 4. Purple Pi R1 Dimensional Drawing

## 2、Technical parameter

### 2.1 Hardware parameters

Basic parameters	
SOC	SigmaStar SSD201/SSD202
CPU	ARM® Cortex-A7 dual-core processor up to 1.2GHz
GPU	Supports maximum resolution FHD (1920x1080)/60 frames decoding, H.265/HEVC decoder, I/P/B slices, all intra prediction modes, all intra prediction modes, supports maximum resolution HD (1920x1080)/60 frames decoding
Memory	Built-in DDR2/DDR3 memory, support automatic refresh and self-refresh mode, default 64MB (maximum support 128MB)
Storage	Support 1/2/4-bit SPI-NOR/SPI-NAND Flash, default 128MB (maximum support 512MB) 1 × TF-Card Slot x1 (supports TF card expansion)
Hardware parameters	
Ethernet	10/100Mbps x 2, Half/Full Duplex Ethernet
wireless network	WIFI IEEE 802.11b/g/n
Display interface	RGB565 x 1 4lan MIPI-DSI x 1, support FHD (1920x1080)/60 frame decoding output
Audio port	Headphone output x 1 Microphone onboard audio input x 1
Extension ports	USB 2.0 x 1 Debug x 1 UART x 3 SPI x 1 I2C x 1 IR x 1 DMIC x 2 PWM x 1 ADC x 1 GPIO x 21

## 2.2 Working environment

Working environment	
Operating temperature	0°C~70°C
Working humidity	5~90% RH non-condensing
Storage temperature	-40°C~85°C

## 2.3 System Support

Serial number	Operating system	Support	Explanation
1	Linux4.9.84	<input checked="" type="checkbox"/>	

## 3、Main interface definition

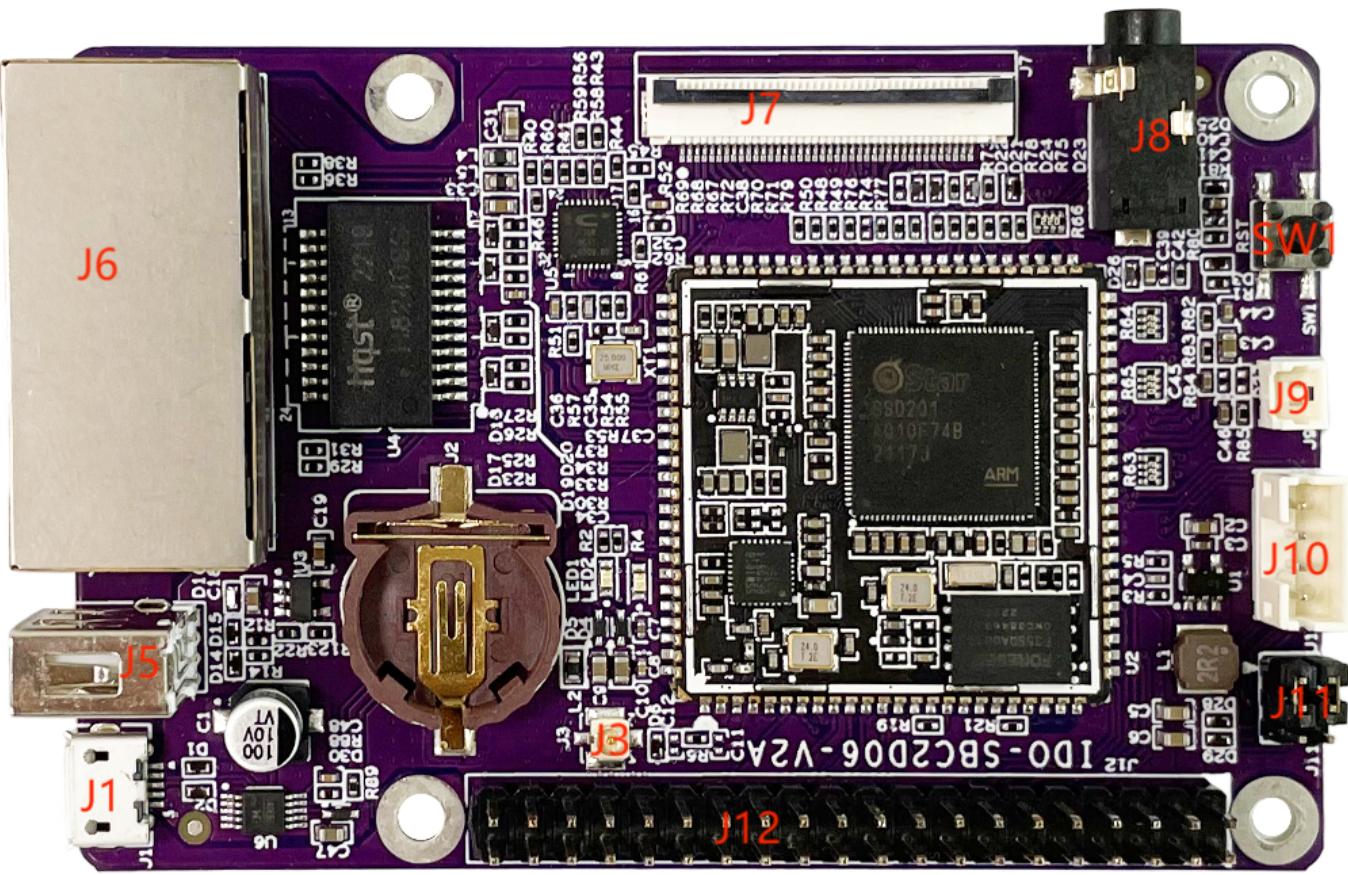


Figure 5. Purple Pi R1 front interface bit number map

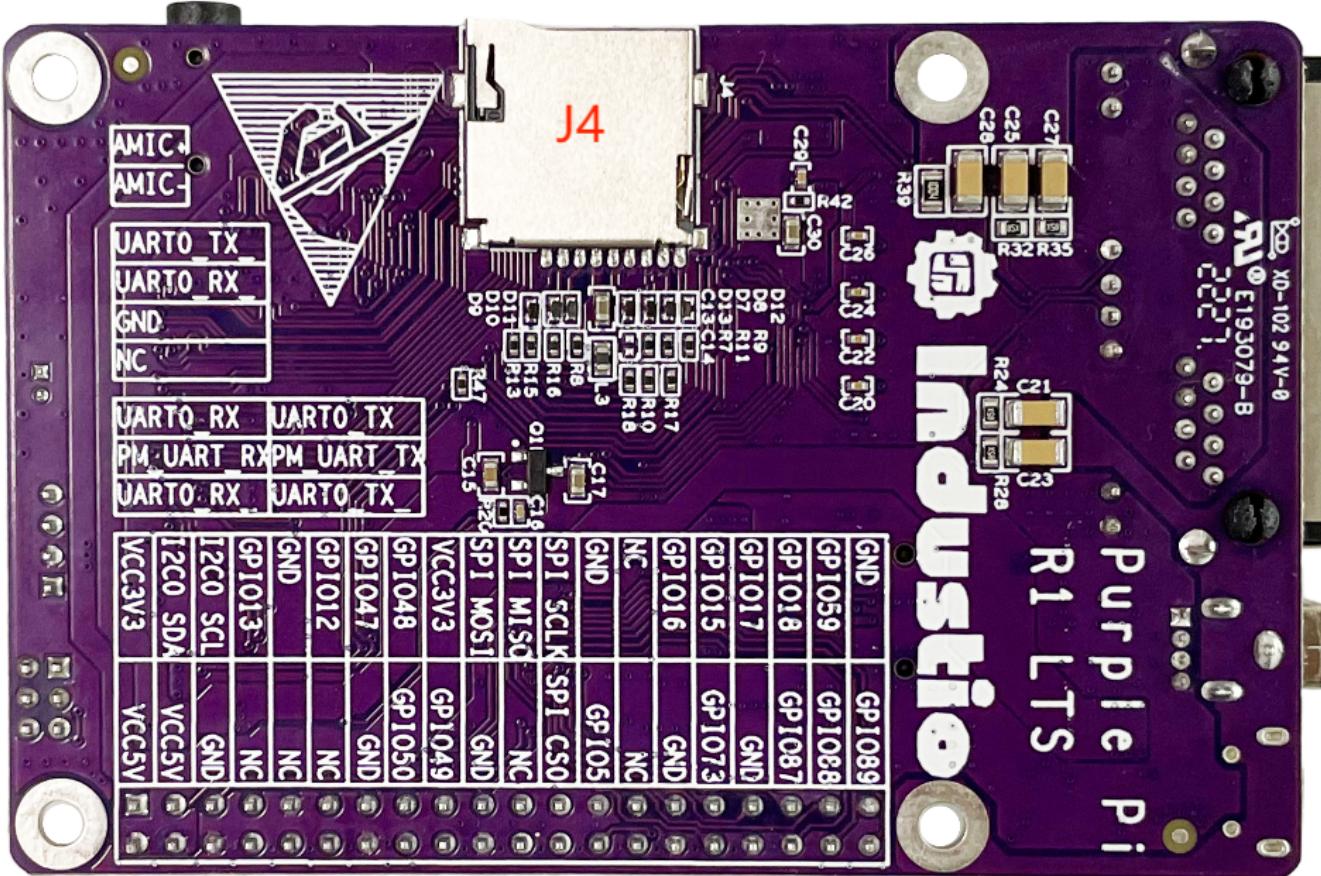


Figure 6. Purple Pi R1 reverse interface bit number map

### 3.1 Power interface

Mainboard rated voltage: 5V.

Current requirements: greater than 500mA.

The motherboard provides two power supply methods:

1. The motherboard is powered by the J1 MicroUSB socket by default.
2. Power supply through the J12 expansion interface, refer to the interface definition in the expansion interface section.

### 3.2 Debug serial port

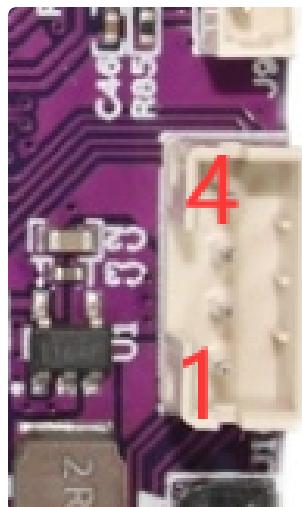
The motherboard provides 2 debug serial ports (J1 MIRCOUSB and J10 PH2.0-4P):

1. In the case that the firmware of the motherboard has been burned before leaving the factory, the default is to enter the system through the J1 MicroUSB socket (USB to serial port chip CH340E). At this time, the debugging serial port selection socket is connected through the jumper cap (1 and 3 are shorted, 2 and 4 shorted).



Figure 7. Purple Pi R1 MIRCOUSB Debug Interface

2. When you need to burn uboot, you need to connect the computer through the J10 PH2.0-4P socket (PM\_UART). At this time, the debugging serial port selection socket is connected through the jumper cap (3 and 5 are short-circuited, 4 and 6 are short-circuited).  
**Debug serial port (J10 PH2.0-4P straight white)**



Serial number	Definition	Level/V	Explanation
1	NC	NC	NC
2	GND	GND	Power ground
3	PM_UART_RX	3.3V	UART data
4	PM_UART_TX	3.3V	communication

### 3.3 Extension ports

The main board uses 2x20 double-row pin headers as an expansion interface, extending the power interface, serial interface, microphone interface and multiplexing GPIO interface.

**Expansion interface signal definition (J12 2X20 2.54mm pitch double row pin 180°through hole straight pin black)**



Serial number	Definition	Level/V	Explanation
1	3V3	3.3V	3.3V power output
2	VCC5V	5V	5V, can be used as power input
3	I2C0_SDA	3.3V	I2C0 data signal
4	VCC5V	5V	5V, can be used as power input
5	I2C0_SCL	3.3V	I2C0 clock signal
6	GND	GND	GND
7	GPIO13	3.3V	I/O
8	NC	3.3V	NC
9	GND	GND	GND
10	NC	/	NC
11	GPIO12	3.3V	I/O

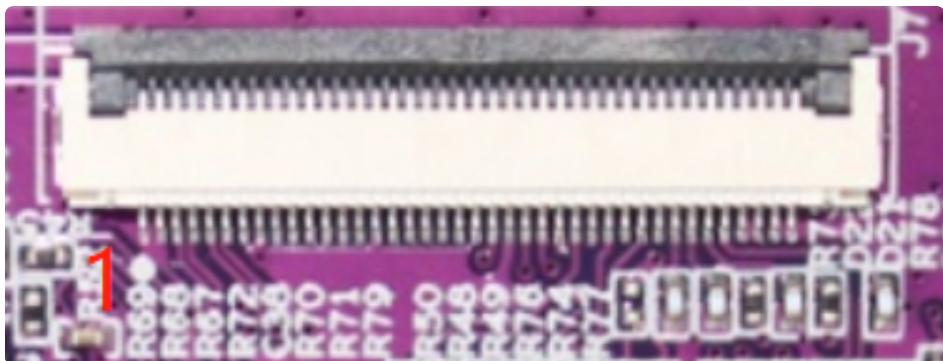
12	NC	/	NC
13	GPIO47	3.3V	I/O
14	GND	GND	GND
15	GPIO48	3.3V	I/O
16	GPIO50	3.3V	I/O, can be multiplexed as UART1_TX
17	3V3	3.3V	3.3V power output
18	GPIO49	3.3V	I/O, can be multiplexed as UART1_RX
19	SPI0_MOSI	3.3V	SPI0 data output
20	GND	GND	GND
21	SPI0_MISO	3.3V	Data input of SPI0
22	NC	/	NC
23	SPI0_CLK	3.3V	SPI0 clock
24	SPI0_CS0	3.3V	SPI0 chip select
25	GND	GND	GND
26	GPIO5	3.3V	I/O, can be multiplexed as PWM1
27	NC	/	NC
28	NC	/	NC
29	GPIO16	3.3V	I/O, can be multiplexed as FUART_TX
30	GND	GND	GND

31	GPIO15	3.3V	I/O, can be multiplexed as FUART_RX
32	GPIO73	3.3V	I/O, can be multiplexed as ADC2
33	GPIO17	3.3V	I/O, can be multiplexed as FUART_CTS
34	GND	GND	GND
35	GPIO18	3.3V	I/O, can be multiplexed as FUART_RTS
36	GPIO87	3.3V	I/O, can be multiplexed as DMIC_R
37	GPIO59	3.3V	I/O, can be multiplexed as IR input
38	GPIO88	3.3V	I/O, can be multiplexed as DMIC_L
39	GND	GND	GND
40	GPIO89	3.3V	I/O, can be multiplexed as DMIC_CLK

### 3.4 RGB

1. The default configuration is RGB. TP can be supported.
2. Support 1-way MIPI-DSI, 4-Lane.

## RGB interface (J7 40Pin FPC 0.5mm connected on top)



Serial number	Definition	Level/V	Explanation
1	GND	GND	GND
2	GND	GND	GND
3	Panel_R3	/	RGB data
4	Panel_R4	/	
5	Panel_R5	/	
6	Panel_R6	/	
7	Panel_R7	/	
8	GND	GND	GND
9	Panel_G2	/	RGB data
10	Panel_G3/MIPI_TX_D 0P	/	RGB data, can be used as MIPI_TX_D0 signal pair
11	Panel_G4/MIPI_TX_D 0N	/	
12	Panel_G5/MIPI_TX_D 1P	/	RGB data, can be used as MIPI_TX_D1 signal pair
13	Panel_G6/MIPI_TX_D 1N	/	

14	Panel_G7/MIPI_TX_C KP	/	RGB data, can be used as MIPI_TX_CK signal pair
15	GND	GND	GND
16	Panel_B3/MIPI_TX_C KN		RGB data, can be used as MIPI_TX_CK signal pair
17	Panel_B4/MIPI_TX_D 2P	/	RGB data, can be used as MIPI_TX_D2 signal pair
18	Panel_B5/MIPI_TX_D 2N	/	
19	Panel_B6/MIPI_TX_D 3P	/	RGB data, MIPI_TX_D3 signal pair
20	Panel_B7/MIPI_TX_D 3N	/	
21	GND	GND	GND
22	Panel_DCLK	/	clock
23	GND	GND	GND
24	Panel_HS	/	control signal
25	Panel_VS	/	control signal
26	GND	GND	GND
27	Panel_DE	/	control signal
28	GND	GND	GND
29	LCD_PWM	/	Screen backlight control signal
30	GND	/	GND
31	LCD_RSTB	3.3V	screen reset

32	GND	/	MIPI_DSI_TX0_D0 signal pair
33	RST#	3.3V	TP reset
34	INTn	/	GND
35	TP_SDA	3.3V	TP data signal
36	TP_SCL	3.3V	TP clock signal
37	SYS_3V3	/	3.3V
38	SYS_3V3	3.3V	3.3V
39	VCC5V	5V	5V
40	VCC5V	5V	5V

Supplementary note: MIPI-DSI0 and RGB share the same signal, and only one function can be used at the same time.

### 3.5 MIC interface (J27 PH2.0–2P straight white)



Single microphone recording

Serial number	Definition	Level/V	Explanation

1	AUD_MIC-	/	MIC left channel input
2	AUD_MIC+	/	MIC right channel input

### 3.6 MIC right channel input ( J26 )

Support one standard three-section headphone holder.

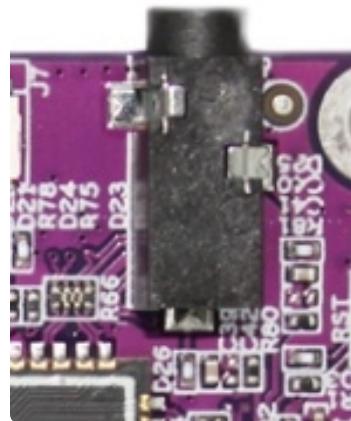


Figure 8. Purple Pi R1 headphone jack

### 3.7 TF card holder ( J10 )

TF card holder supports SD3.0, supports high-speed SD card.

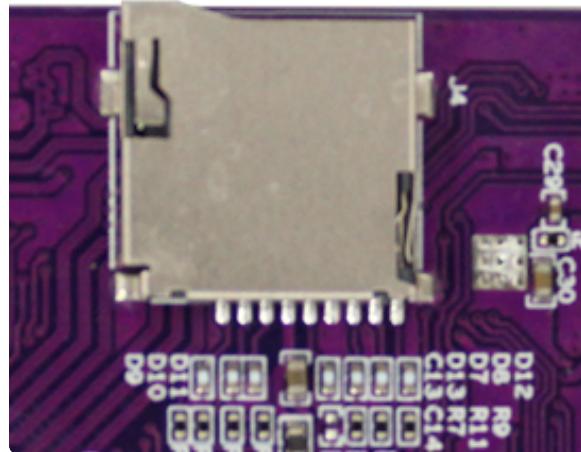


Figure 9. Purple Pi R1 TF card interface

## 3.8 USB interface

Provides 6 USB2.0 interfaces, 4 of which use PH2.0–4P straight sockets, and the remaining 2 use standard USB TYPE-A female sockets. Each USB software independently controls external power supply. The external power supply capacity of each USB is 5V@500mA.

### 3.8.1 USB2.0 interface ( J1+J2 USB2.0 TYPE-A female socket white )

- The motherboard provides a standard USB2.0 TYPE-A female socket, which can support standard USB memory disks and other devices;

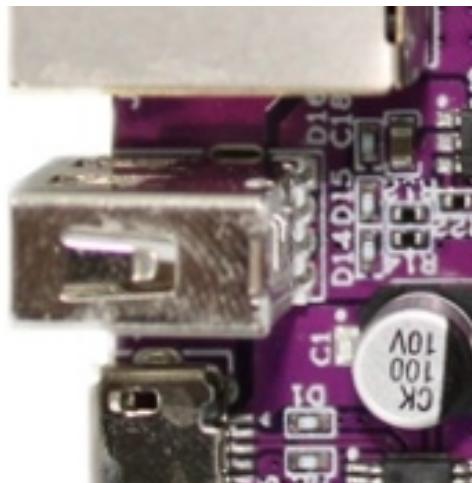


Figure 10. Purple Pi R1 USB interface

## 3.9 Ethernet interface

Provide 2-way Ethernet interface, 10/100Mbps adaptive.

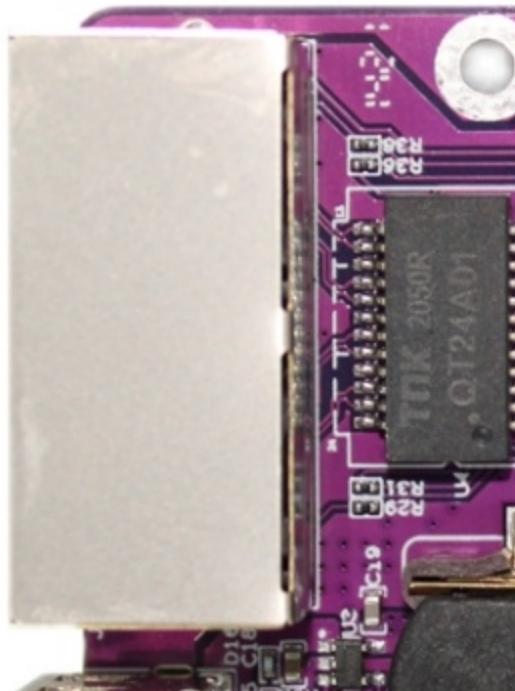
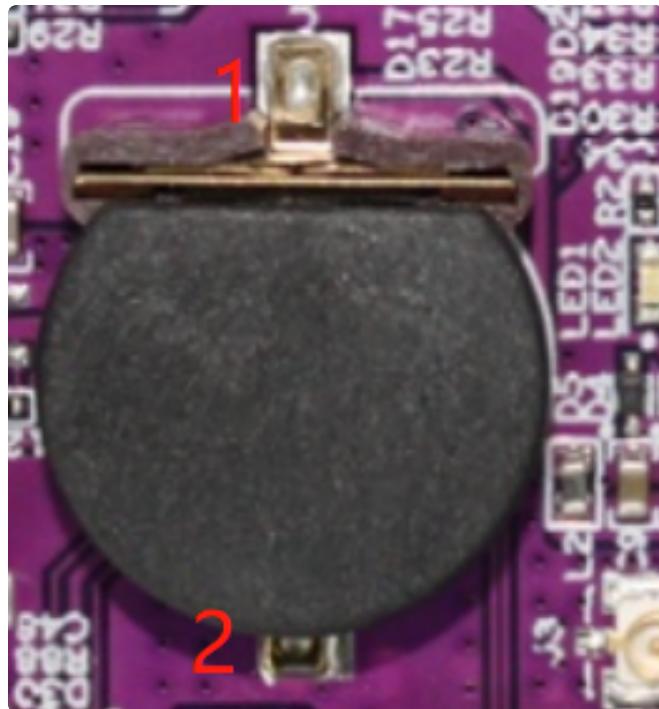


Figure 11. Purple Pi R1 RJ45 interface

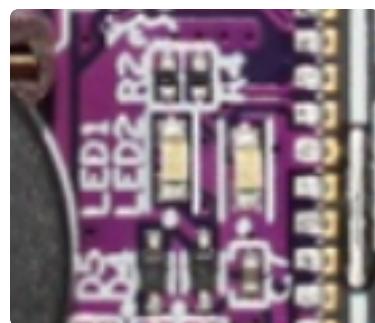
## 3.10 RTC battery (J40 1220 coin cell holder)



The motherboard has an RTC battery interface, which uses a 1.25mm 2P socket. Make sure that the time of the motherboard keeps working normally when the main board is powered off.

Serial number	Definition	Level/V	Explanation
1	RTC-3.3V	3.3V	Power 3.3V output
2	GND	GND	GND

### 3.11 LED Indicator



Serial number	Definition	Level/V	Explanation

LED2	Power_LED	3.3V	Always on when power on
LED1	System_LED	3.3V	System running status indicator, the frequency indicates the current CPU load

## 3.12 Reset button

Reset key, used to restart the system.

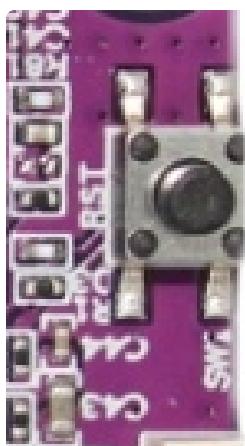


Figure 12. Purple Pi R1 reset button

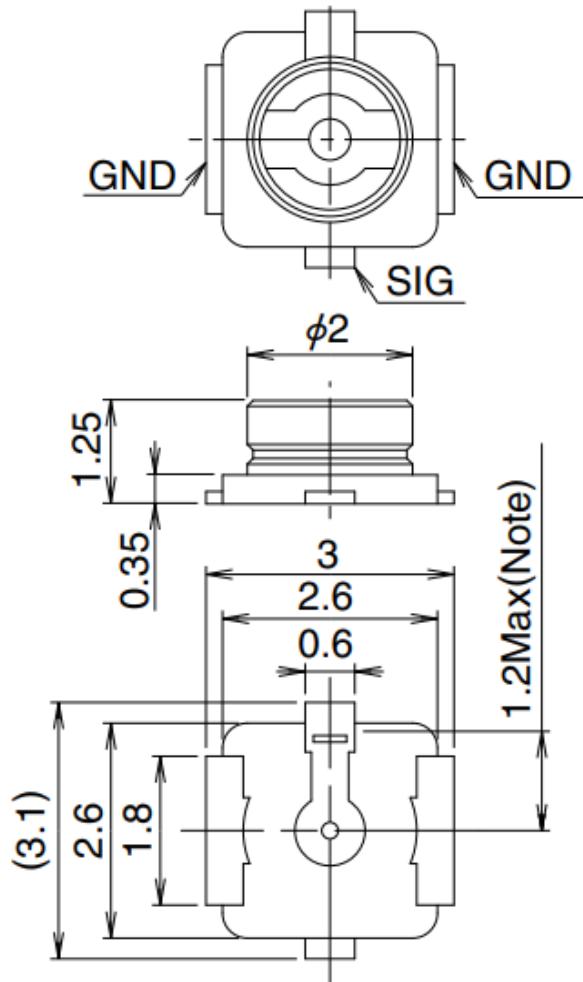
## 3.13 WIFI

Onboard WIFI, supporting Singmaster wifi chip (SSW101B).

The WIFI antenna adopts IPEX 1 generation seat.



Figure 13. Purple Pi R1 IPEX generation pod



**U.FL-R-SMT-1**

Figure 14. Schematic diagram of Purple Pi R1 IPEX generation transposon

## 4、Electrical properties

### 4.1 Standard power

Attributes		minimum	typical	maximum
Standard power	Voltage	4V	5V	5.5V
	ripple	/	/	50mV
	current	/	500mA	/

## 4.2 Operating current without any peripherals

Attributes		minimum	typical	maximum
Standard power	Working current	/	200mA	300mA
	stand-by current	/	/	/
	Shutdown current	/	/	/

## 4.3 USB powered

Attributes		Voltage	Typical current	Maximum current
Standard power	USB2.0	/	/	500mA

Note: It is recommended that the total current of USB peripherals should not exceed 500mA, otherwise the machine will not work properly.

## 5、Precautions for use

When using the motherboard, please pay special attention to the following:

1. After taking the motherboard out of the box, please make sure that there are no pins or other short circuits caused by transportation before powering on.
2. Electronic products are very sensitive to static electricity. Before handling the motherboard, please wear an electrostatic wristband or electrostatic gloves to conduct static electricity away from your body.

3. Please plug and unplug components under power-off condition. Before connecting the power connector to the motherboard, please make sure that the power is turned off to avoid damage to sensitive components caused by instantaneous power shocks.
4. When connecting peripherals through wires, please make sure that the pin definitions of each peripheral correspond to the mainboard interface to avoid short-circuit burning of the board due to wrong wire sequence.
5. When fixing the motherboard with screws, be careful to avoid PCB open circuit or components falling off due to the deformation of the board.
6. When connecting a screen with a selectable voltage (LVDS, eDP, etc.), please note that the voltage selected by the jumper is consistent with the screen specification.
7. When connecting peripherals such as SATA/USB/extensions, pay attention to the current limit.
8. When connecting the serial port and CAN port, pay attention to whether the serial port level matches, and avoid connecting the UART to the RS232 or RS485 level. UART/RS232 Note the RX-TX interconnect. Note A-A/B-B, H-H/L-L for RS485/CAN interface.
9. When selecting a power supply, pay attention to the voltage and current that meet the power requirements of the motherboard and peripherals.
10. When designing the whole product, the heat dissipation and height limit of the motherboard should be considered.
11. When the motherboard is not usually in use, please place the motherboard on an electrostatic table mat or an electrostatic bag and seal it for storage.