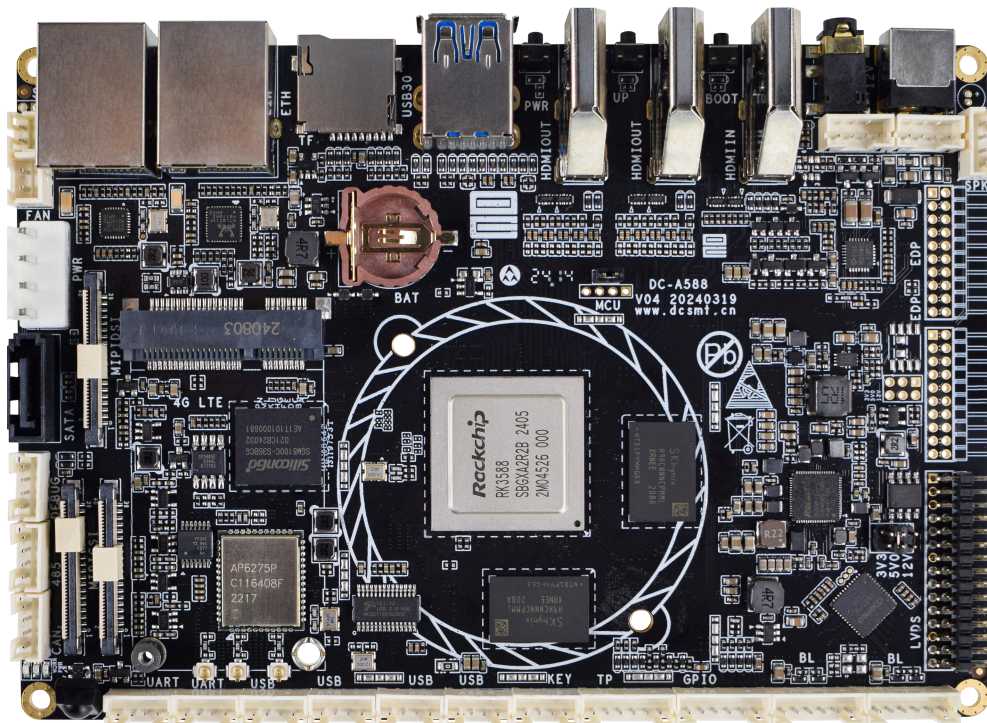

BTP-PCM-A-A588

Technical Specifications



Edition	Date	Changes
V1.0	2024-5-24	Initial release

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1. Electrical performance

1.1. Electrical performance

1.1.1. Standard power supply

Category		Min.	Typical	Max.
Standard power parameters	Voltage	11.4V	12V	12.6V
	Ripple	-	100mV	150mV
	Electric current	3A	5A	-
12V power supply only for HDMI board power consumption)	Static power consumption	-	2W	-
	Sleep power consumption	-	1.2W	-
LVDS power supply output current (2 * 3Pin)	3.3V working current			0.8A
	5V working current			0.8A
	12V working current			0.8A
USB (5V) Output current	-	1A (1*USB type-A)	2A	
12V Output current			2A	

- ① The total output current of 3.3V shall not exceed 3A;
- ② The total output current of 5V shall not exceed 3A;
- ③ The output current of LVDS backlight cannot exceed 1.5A;
- ④ 12V power input, on the basis of ensuring a minimum current of 3A, increases correspondingly with the total power of peripheral electrical devices;
- ⑤ The PCIE interface of the 4G module is powered by 3.8V;

2. Product overview

2.1. Introduction

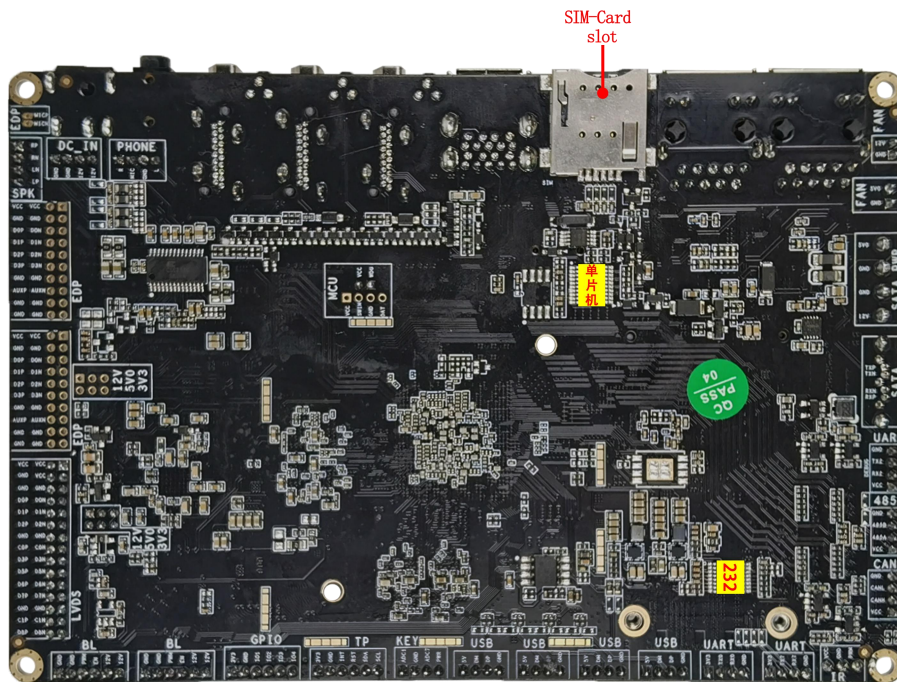
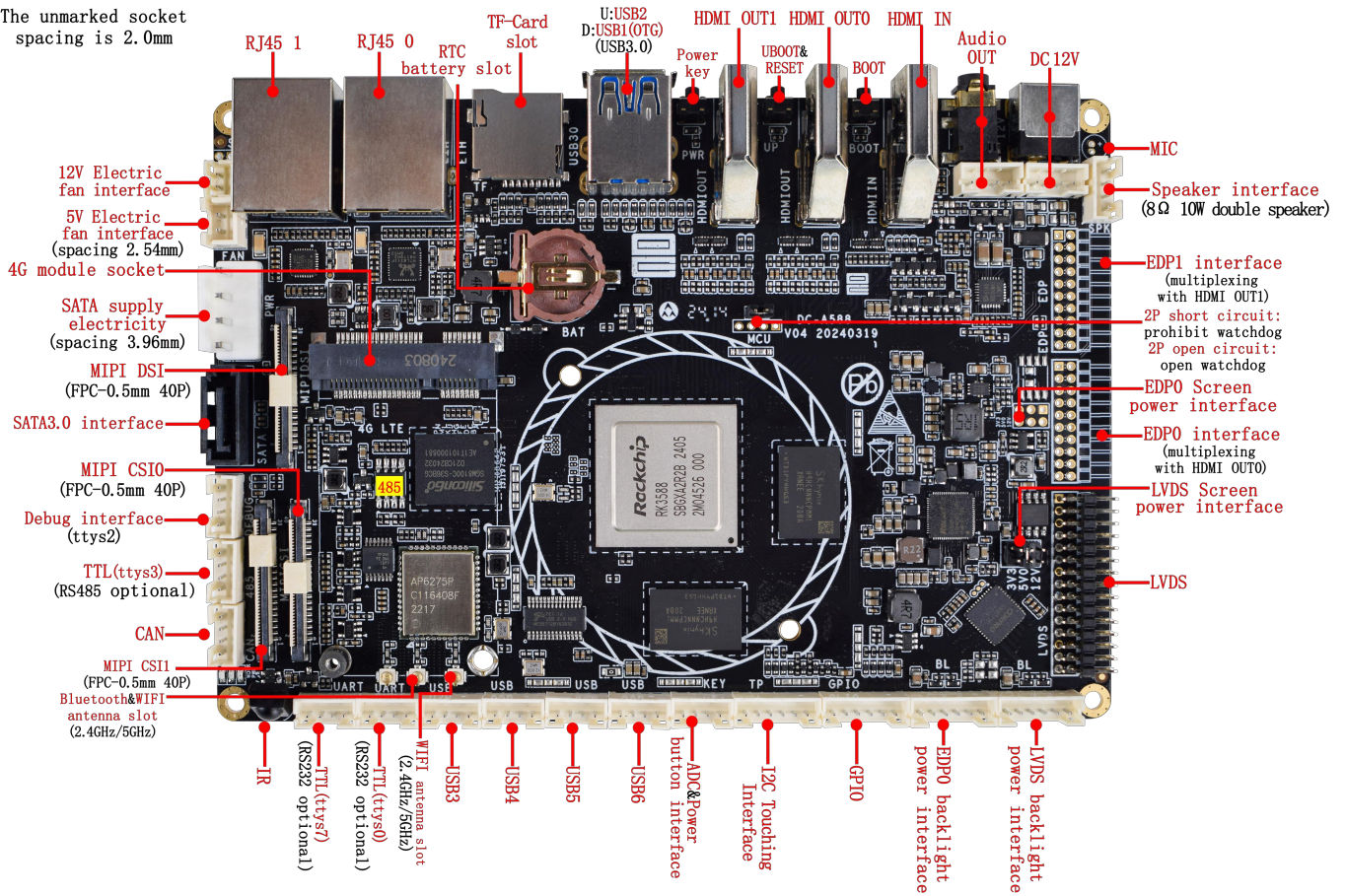
A588, adopting the Rockchip high-performance RK3588 new generation flagship eight core 64 bit processor, with a main frequency of up to 2.4GHz; 8nm LP process technology; Integrated ARM Mali-G610 MP4 quad core GPU, supporting OpenGL ES3.2/OpenCL 2.2/Vulkan 1.1, 450 GFLOPS; The built-in NPU has a computing power of up to 6 TOPS and supports mixed operations of INT4/INT8/INT16. It can achieve network model conversion based on TensorFlow/MXNet/PyTorch/Cafe and other frameworks.

2.2. Characteristics

- ① High performance:8-core 64 bit (4xCortex-A76+4xCortex-A55), advanced 8nm technology, with a main frequency of up to 2.4GHz.
- ② Multi-channel display interface:Multiple display output interfaces including LVDS, EDP, MIPI, HDMI2.1, and HDMI RX2.0/MIPI_CSI video input interface, supporting multi-channel 8K video output and 4K video input, can achieve multi-screen display.
- ③ Multiple network interfaces:Dual Gigabit Ethernet, 2.4GHz/5GHz dual band WiFi 6 (802.11ax), Bluetooth 5.0, supporting 5G/4G LTE expansion, allowing for higher network communication rates.
- ④ Rich expansion interface:support USB2.0, USB3.0, TTL, RS232, RS485, SPK, CAN, GPIO, SATA, PCIe3.0x2 expansion interface.
- ⑤ Support Android and Linux systems, support system optimization, development customization, provide secondary development source code examples, suitable for APK development;
- ⑥ It is mainly targeted at ARM PC, cloud server, smart big screen, edge computing, smart NVR, AR/VR, smart car and other customized markets.

3. Appearance and Port Description

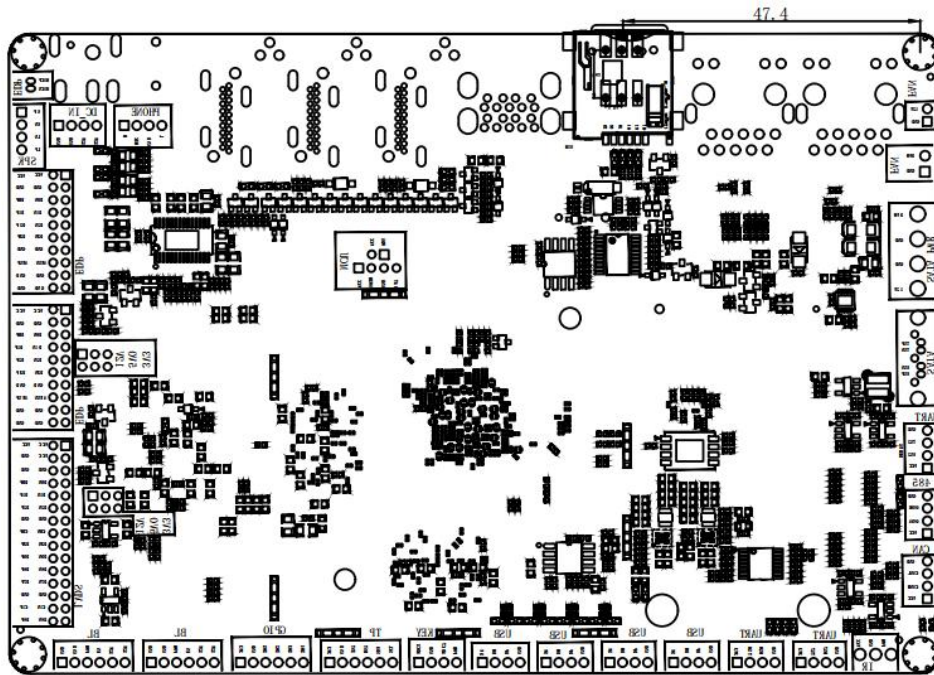
The unmarked socket spacing is 2.0mm



4. List of Basic Functions

Core devices	
CPU	RK3588, 8-core 64 bit (4xCortex-A76+4xCortex-A55), advanced 8nm technology, with a main frequency of up to 2.4GHz
GPU	ARM Mali-G610 MP4 Quad Core GPU. Supports OpenGL ES3.2/OpenCL 2.2/Vulkan1.1, 450 GFLOPS
NPU	NPU has a computing power of up to 6 TOPS and supports mixed operations of INT4/INT8/INT16, Can achieve network model transformation based on TensorFlow/MXNet/PyTorch/Caffe series frameworks
Flash memory	4GB/8GB/16GB 64bit LPDDR4x (Up to 16GB can be configured)
Memory expansion	eMMC 16G/32G/64G/128G
Memory expansion	Up to 128GB of TF card expansion support
Display Interface	
HDMI IN	1*HDMI IN, with a maximum support resolution of 4K
HDMI OUT	2*HDMI OUT, with a maximum support resolution of 8K(multiplexing with EDP)
LVDS interface	1* LVDS interface, with a maximum support resolution of 1080P
EDP interface	2 * EDP interface, with a maximum support resolution of 4K(multiplexing with HDMI, and cannot be used by default)
MIPI DSI Interface	1 * 4lane, with a maximum support resolution of 1920x1200
Audio Interface	
Headset	1*microphone single channel input(analogue signal) 1*audio dual channel output (analogue signal)
MIC interface	1*channel microphone input interface
Amplifier	Left and right dual-channel output, support 8 Ω 10W dual speakers
Network Support	
Ethernet	2*standard RJ 45 interfaces, 10 / 100 / 1000M adaptive Ethernet
Wifi/Bluetooth	On-board WIFI / BT module, support WiFi 2.4GHz / 5GHz dual-frequency, support 802.11a/b/g/n/ac protocol, support Bluetooth 4.0 (support BLE)

Mobile network	1*built-in MINI PCI_E slot to connect 3G / 4G module
Basic Interface	
USB	5*USB Host interfaces (1*external standard USB 3.0 socket, 4*2.0mm-4P sockets) for external high-definition USB cameras, USB drives, keyboards, mice, and other devices
USB OTG	1*USB OTG interface for system debugging, firmware updates, and can also be set to Host mode
Serial port	4*channels of serial ports, including 3*channels of TTL (2*channels can be optionally configured as RS232 serial port, 1*channel can be optionally configured as RS485 serial port), and 1*channel of TTL debugging serial port
GPIO Interface	Provides 4 IO ports for free definition of input and output status
RTC	Support for real-time clock, 1220 button battery power supply
MIPI camera	Support for dual MIPI camera input
Timed switch machine	Optional
hardware watchdog	Optional
Infrared receiving	Optional
Infrared remote control startup	Optional
Other	
Operating system	Android 12 (default) /debian11/ubuntu20.04/KylinOSV10/StarKylinV1.0
Power socket	1* DC 12V Input (DC-5.5*2.5MM), 1*4P Input (2.0mm-4P)
Adaptive	12V 2-5A
system upgrade	Support for PC/U disk/TF card upgrade
Working Environment	
working temperature	0°C~70°C, recommended 5°C~35°C
working humidity	10%~90%, with no condensation
Storage Temperature	-30°C~75°C, recommended storage at room temperature



5.2. Specifications parameters

Main board size:148*106*20.5mm

Main board height:front side \leq 16.5mm,back side \leq 3mm

Main board height:8 layers

PCB Size:148*102*1.6mm

PCB Color:Black

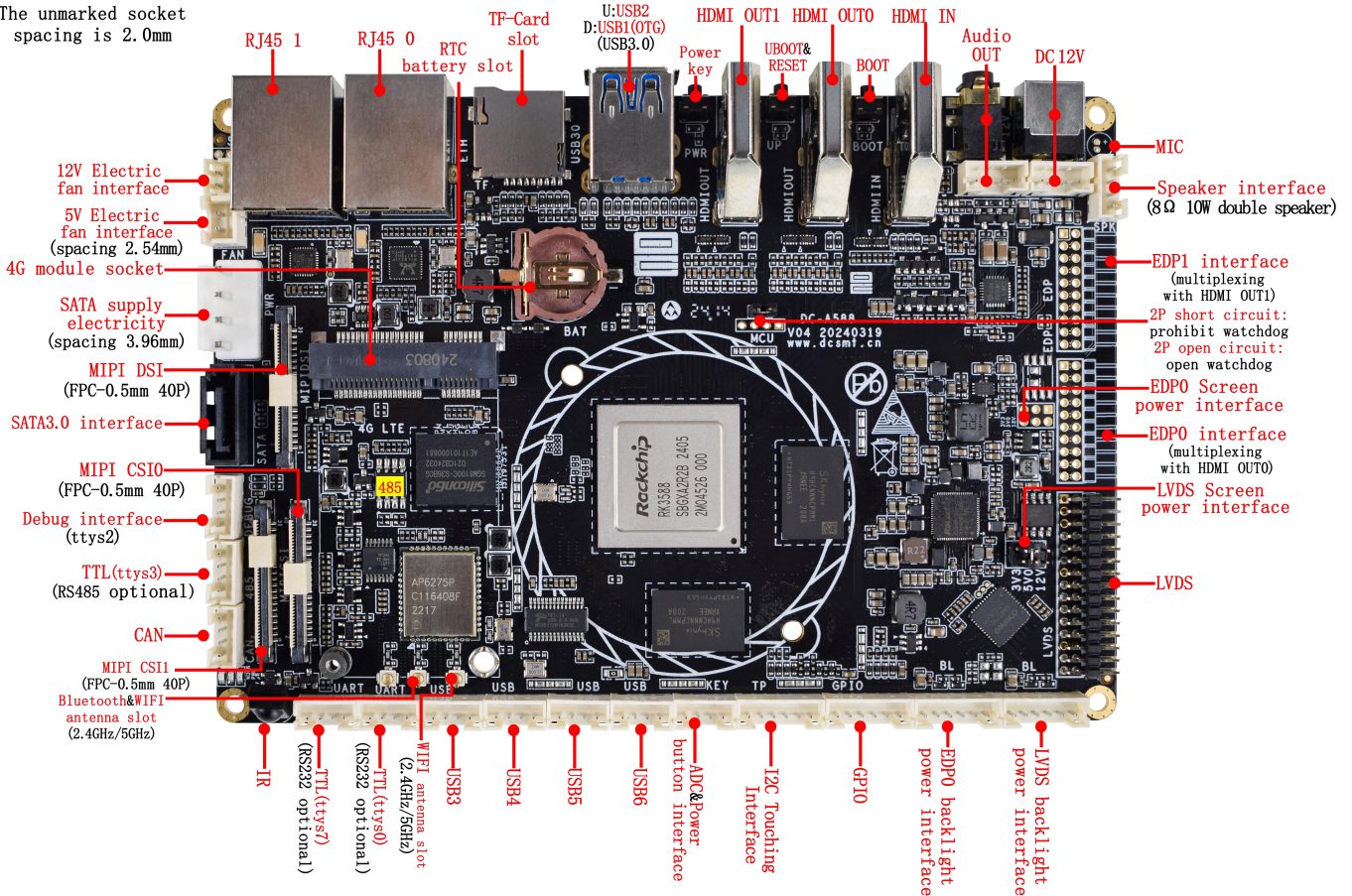
PCB Technique:Sink gold

Screw hole specification: Φ 3mm*4

6. Interface Specification

6.1. Interface description

The unmarked socket spacing is 2.0mm



* Note: Except for the switching power interface and DC interface, the other interfaces cannot be connected to power input;

“■” The solder pad is the first pin defined for the socket interface;

6.1.1. 12V Electric fan interface

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	12V	Power	+12V Output

6.1.2. 5V Electric fan interface

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	5V	Power	+5V Output

6.1.3. SATA supply electricity

No.	Definition	Attribute	Description
1	12V	Power	+12V Output
2	GND	Ground	Ground

3	GND	Ground	Ground
4	5V	Power	+5V Output

6.1.4. SATA 3.0 interface

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	TXP	Output	Data sent+
3	TXN	Output	Data sent-
4	GND	Ground	Ground
5	RXN	Input	Data acceptance-
6	RXP	Input	Data acceptance+
7	GND	Ground	Ground

6.1.5. Debug interface

No.	Definition	Attribute	Description
1	VCC	Power	+3.3V Output
2	RX2	Input	Serial port 2 data receiving (TTL)
3	TX2	Output	Serial port 2 data sending (TTL)
4	GND	Ground	Ground

*This interface is the default system debugging port (not software debugging port), can be changed to ordinary serial port for use, please contact the business if;

*Serial port 2 device number is ttys2;

6.1.6. TTL interface (Serial port 3)

No.	Definition	Attribute	Description
1	VCC	Power	+3.3V Output
2	RX3/A	Input	RS485-A/Serial port 3 data receiving (TTL)
3	TX3/B	Output	RS485-B/Serial port 3 data sending (TTL)
4	GND	Ground	Ground

*The node of serial port 3 is ttys 3;

*Default TTL serial port, optional as RS485 serial port;

6.1.7. CAN interface

No.	Definition	Attribute	Description
1	VCC	Power	+5V Output
2	CANH	Input	CANH signal line
3	CANL	Output	CANL signal line
4	GND	Ground	Ground

6.1.8. MIPI DSI TX0 interface



Note: This interface can be used to connect the MIP screen, please check the screen specification to confirm whether the interface definition is consistent, if the inconsistent

screen can be converted through the transfer board, please contact the business for details;

Before inserting the line, please confirm the direction of the line (up / down), and then insert the line to avoid damage to the display screen and main board;

No.	Definition	Attribute	Description
1	NC	-	-
2	VCC_LCD	Power	+1.8V Output
3	VCC_LCD	Power	+1.8V Output
4	GND	Ground	Ground
5	RESET	Output	reset
6	NC	-	-
7	GND	Ground	Ground
8	MIPI_TXO_D0_N	Output	The MIPI data channel 0 is negative
9	MIPI_TXO_D0_P	Output	The MIPI data channel 0 is positive
10	GND	Ground	Ground
11	MIPI_TXO_D1_N	Output	The MIPI data channel 1 is negative
12	MIPI_TXO_D1_P	Output	The MIPI data channel 1 is positive
13	GND	Ground	Ground
14	MIPI_TXO_CLK_N	Output	The MIPI data channel clock is negative
15	MIPI_TXO_CLK_P	Output	The MIPI data channel clock is positive
16	GND	Ground	Ground
17	MIPI_TXO_D2_N	Output	The MIPI data channel 2 is negative
18	MIPI_TXO_D2_P	Output	The MIPI data channel 2 is positive
19	GND	Ground	Ground
20	MIPI_TXO_D3_N	Output	The MIPI data channel 3 is negative
21	MIPI_TXO_D3_P	Output	The MIPI data channel 3 is positive
22	GND	Ground	Ground
23	NC	-	-
24	NC	-	-
25	GND	Ground	Ground
26	NC	-	-
27	NC	-	-
28	NC/BIST	Empty / ground	Ground
29	NC	-	-
30	GND	Ground	Ground
31	MIPI_VLED-	Output	MIPI backlight negative electrode
32	MIPI_VLED-	Output	MIPI backlight negative electrode
33	NC	-	-
34	VSN_-5V5	Output	MIPI Pixel Point Switch tube-5.5V
35	VSN_-5V5	Output	MIPI Pixel Point Switch tube-5.5V
36	NC	-	-
37	VSP_5V5	Output	MIPI pixel point switch tube + 5.5V
38	VSP_5V5	Output	MIPI pixel point switch tube + 5.5V
39	MIPI_VLED+	Output	MIPI backlight positive electrode
40	MIPI_VLED+	Output	MIPI backlight positive electrode

6.1.9. MIPI_CSI_RX0 interface



Before inserting the line, please confirm the direction of the line (up / down), and then insert the line to avoid damage to the display screen and main board;

No.	Definition	Attribute	Description	Voltage domain
1	VCC_2V8_CAM3	Power	+2.8V LDO output	
2	RGB_AVDD3V3_CAM3	Power	+3.3V LDO output	
3	IR_RGB_PWDN	Input/Output	GPIO1_A7_u	1.8V
4	CAM3_RST_L	Input/Output	Reset	1.8V
5	I2C3_SCL_MO_MIPI	Input/Output	SCL clock signal (GPIO1_C1_z)	1.8V
6	I2C3_SDA_MO_MIPI	Input/Output	SCL clock signal (GPIO1_C0_z)	1.8V
7	GND	Ground	Ground	
8	CAM_MCLK3	Input/Output	MIPI clock signal (GPIO3_B0_u)	3.3V
9	GND	Ground	Ground	
10	RX0_CLKP	Input	data channel	
11	RX0_CLKN	Input	data channel	
12	GND	Ground	Ground	
13	RX0_D0P	Input	data channel	
14	RX0_D0N	Input	data channel	
15	GND	Ground	Ground	
16	RX0_D1P	Input	data channel	
17	RX0_D1N	Input	data channel	
18	GND	Ground	Ground	
19	VCC_1V8_CAM3	Power	+1.8V output	
20	IR_RGB_SYNC0	Input/Output	GPIO2_C4	1.8V
21	NC	-	-	
22	VCC_1V2_CAM3	Power	+1.2V LDO output	
23	VCC_1V2_CAM3	Power	+1.2V LDO output	
24	IR_RGB_PWDN		GPIO1_A7_u	1.8V
25	CAM3_RST_L	Input/Output	Reset	1.8V
26	GND	Ground	Ground	
27	CAM_MCLK3	Input/Output	MIPI clock signal (GPIO3_B0_u)	3.3V
28	GND	Ground	Ground	
29	RX0_CLK1P	Input	Data channel clock	
30	RX0_CLK1N	Input	Data channel clock	
31	GND	Ground	Ground	
32	RX0_D2P	Power	data channel	
33	RX0_D2N	Input	data channel	
34	GND	Ground	Ground	
35	RX0_D3P	Input	data channel	
36	RX0_D3N	Input	data channel	

37	GND	Ground	Ground	
38	5V	Power	+5V Output	
39	5V	Power	+5V Output	
40	5V	Power	+5V Output	

6.1.10. MIPI_CSI_RX1 interface



Before inserting the line, please confirm the direction of the line (up / down), and then insert the line to avoid damage to the display screen and main board;

No.	Definition	Attribute	Description	Voltage domain
1	VCC_2V8_CAM4	Power	+2.8V LDO output	
2	RGB_AVDD3V3_CAM4	Power	+3.3V LDO output	
3	IR_RGB_PWDN4	Input/Output	GPI01_BO_u	1.8V
4	MIPI_CAM4_RESET	Input/Output	Reset	1.8V
5	I2C4_SCL_M3_MIPI	Input/Output	SCL clock signal (GPI01_A3_d)	1.8V
6	I2C4_SDA_M3_MIPI	Input/Output	SDA data signal (GPI01_A2_d)	1.8V
7	GND	Ground	Ground	
8	CAM_MCLK4	Input/Output	MIPI clock signal (GPI03_B1_d)	3.3V
9	GND	Ground	Ground	
10	RX1_CLKP	Input	data channel	
11	RX1_CLKN	Input	data channel	
12	GND	Ground	Ground	
13	RX1_DOP	Input	data channel	
14	RX1_DON	Input	data channel	
15	GND	Ground	Ground	
16	RX1_D1P	Input	data channel	
17	RX1_D1N	Input	data channel	
18	GND	Ground	Ground	
19	VCC_1V8_CAM4	Power	+1.8V output	
20	IR_RGB_SYNC1	Input/Output	GPI02_C4	1.8V
21	NC	-	-	
22	VCC_1V2_CAM4	Power	+1.2V LDO output	
23	VCC_1V2_CAM4	Power	+1.2V LDO output	
24	IR_RGB_PWDN4		GPI01_BO_u	1.8V
25	MIPI_CAM4_RESET	Input/Output	Reset	1.8V
26	GND	Ground	Ground	
27	MIPI_MCLK4	Input/Output	MIPI clock signal (GPI03_B1_d)	3.3V
28	GND	Ground	Ground	
29	RX1_CLK1P	Input	Data channel clock	
30	RX1_CLK1N	Input	Data channel clock	
31	GND	Ground	Ground	
32	RX1_D2P	Power	data channel	

33	RX1_D2N	Input	data channel	
34	GND	Ground	Ground	
35	RX1_D3P	Input	data channel	
36	RX1_D3N	Input	data channel	
37	GND	Ground	Ground	
38	VCC5V0_CAM4	Power	+5V Output	
39	VCC5V0_CAM4	Power	+5V Output	
40	VCC5V0_CAM4	Power	+5V Output	

6.1.11. IR interface

No.	Definition	Attribute	Description	Voltage domain
1	PWM	Input	Infrared receiver signal input (GPIO3_D5)	3.3V
2	GND	Ground	Ground	
3	VCC	Power	+3.3V Output	

6.1.12. TTL (Serial port 0/Serial port 7) interface

No.	Definition	Attribute	Description
1	3.3V	Power	+3.3V Output
2	TX0/TX7	Output	Serial port 0/Serial port 7 data sending (TTL)
3	RX0/RX7	Input	Serial port 0/Serial port 7 data Receiving (TTL)
4	GND	Ground	Ground

*The node of serial port 0 is ttys0; the node of serial port 7 is ttys7;

*Default TTL serial port, optional as RS232 serial port;

6.1.13. USB interface

No.	Definition	Attribute	Description
1	5V	Power	+5V Output
2	DM	Output	USB data line negative pole
3	DP	Output	USB data line positive pole
4	GND	Ground	Ground

6.1.14. ADC & Power button interface

No.	Definition	Attribute	Description	Voltage domain
1	ADC1	Input	Analog voltage input	1.8V
2	GND	Ground	Ground	
3	ADC7	Input	Analog voltage input	1.8V
4	PWR	Input	Power button (valid for short circuit to ground)	

6.1.15. I2C touching interface

No.	Definition	Attribute	Description	Voltage domain
-----	------------	-----------	-------------	----------------

1	3.3V	Power	+3.3V Output	
2	GND	Ground	Ground	
3	INT	Input/Output	Touch Panel Interrupt Signal (GPIO3_C3)	3.3V
4	RST	Input/Output	Touch Panel Reset Signal (GPIO3_B7)	3.3V
5	SDA	Input/Output	I2C5 Data Line (GPIO3_D0)	3.3V
6	SCL	Input/Output	I2C5 Timing Line (GPIO3_C7)	3.3V

6.1.16. GPIO interface

No.	Definition	Attribute	Description	Voltage domain
1	3.3V	Power	+3.3V Output	
2	GND	Ground	Ground	
3	I01	Input/Output	GPIO3_A0	3.3V
4	I02	Input/Output	GPIO3_B3	3.3V
5	I03	Input/Output	GPIO3_B2	3.3V
6	I04	Input/Output	GPIO1_D6	1.8V

6.1.17. EDP0 backlight power interface

It is used for power supply of EDP0 panel, and the current of 12V power supply is not more than 1.5A; and When using a 19 inch or larger screen, or the power of the screen backlight is more than 20W, please take power from other power boards to avoid system instability.

The power for backlight enable is 3.3V, if other voltage is required, please use IO level converter circuit.

This 12V power is only used for backlight, it is forbidden to use for power supply for main-board.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	PWM	Output	Backlight Brightness adjustment signal (0-5V)
4	BL_EN	Output	Backlight enable control signal GPIO3_A6 (3.3V)
5	12V	Power	+12V Output
6	12V	Power	+12V Output

6.1.18. LVDS backlight power interface

It is used for power supply of LVDS panel, and the current of 12V power supply is not more than 1.5A; and When using a 19 inch or larger screen, or the power of the screen backlight is more than 20W, please take power from other power boards to avoid system instability.

The power for backlight enable is 3.3V, if other voltage is required, please use IO level converter circuit.

This 12V power is only used for backlight, it is forbidden to use for power supply for main-board.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	GND	Ground	Ground

3	PWM	Output	Backlight Brightness adjustment signal (0-5V)
4	BL_EN	Output	Backlight enable control signal GPIO3_A6 (3.3V)
5	12V	Power	+12V Output
6	12V	Power	+12V Output

6.1.19. LVDS/EDP0 screen power interface

It is used for power supply or LVDS /EDP0 panel. The screen power can be selected by inserting 2.0mm jumper cap. There are 3.3V/5V/12V for supply, you can select 5V by inserting jumper cap to indicated pins.

To avoid board or screen burning, please note:

1. Please confirm the correct specification or power supply for screen. And power supply meets the maximum current of the screen.
2. Please confirm the correct power of jumper cap by multimeter
3. Every power is forbidden to connect to each other, or the board maybe burnt.

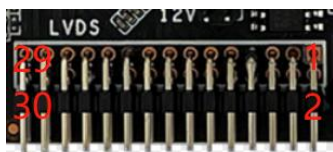


No.	Definition	Attribute	Description	No.	Definition	Attribute	Description
6	VCC	Power	LVDS/EDP Power	5	3.3V	Power	+3.3V
4	5V	Power	+5V	3	VCC	Power	LVDS/EDP Power
2	VCC	Power	LVDS/EDP Power	1	12V	Power	+12V

6.1.20. LVDS interface

Standard LVDS interface, support single/double, 6/8 1080P LVDS screen.

Note: it is only used for LVDS, please confirm the specification, make sure the interface definition is consistent with voltage. If not, please adjust the line.



No.	Definition	Attribute	Description
1	VCC	Power	Output +3.3V/+5V/+12V
2	VCC	Power	Output +3.3V/+5V/+12V
3	VCC	Power	Output +3.3V/+5V/+12V
4	GND	Ground	Ground
5	GND	Ground	Ground
6	GND	Ground	Ground
7	DON	Output	data channel
8	DOP	Output	data channel
9	DIN	Output	data channel
10	DIP	Output	data channel

11	D2N	Output	data channel
12	D2P	Output	data channel
13	GND	Ground	Ground
14	GND	Ground	Ground
15	CON	Output	data channel
16	COP	Output	data channel
17	D3N	Output	data channel
18	D3P	Output	data channel
19	D5N	Output	data channel
20	D5P	Output	data channel
21	D6N	Output	data channel
22	D6P	Output	data channel
23	D7N	Output	data channel
24	D7P	Output	data channel
25	GND	Ground	Ground
26	GND	Ground	Ground
27	C1N	Output	data channel
28	C1P	Output	data channel
29	D8N	Output	data channel
30	D8P	Output	data channel

6.1.21. EDP0/EDP1 interface



Note: This interface is only used to connect the EDP screen. Please check the screen specification to confirm whether the interface definition is consistent with the voltage. If not, please adjust the line order;

No.	Definition	Attribute	Description
1	VCC	Power	Output +3.3V/+5V/+12V
2	VCC	Power	Output +3.3V/+5V/+12V
3	GND	Ground	Ground
4	GND	Ground	Ground
5	D0N	Output	data channel
6	D0P	Output	data channel
7	D1N	Output	data channel
8	D1P	Output	data channel
9	D2N	Output	data channel
10	D2P	Output	data channel
11	D3N	Output	data channel
12	D3P	Output	data channel
13	GND	Ground	Ground
14	GND	Ground	Ground
15	AUXN	Output	data channel
16	AUXP	Output	data channel

17	GND	Ground	Ground
18	GND	Ground	Ground
19	GND	Ground	Ground
20	NC	-	-

6.1.22. Speaker interface

This audio signal is amplified by a built-in amplifier, and it is recommended to connect an external 8 Ω 10W double speaker;

No.	Definition	Attribute	Description
1	RP	Output	Output R+ Audio Signal
2	RN	Output	Output R- Audio Signal
3	LN	Output	Output L- Audio Signal
4	LP	Output	Output L+ Audio Signal

6.1.23. MIC interface

No.	Definition	Attribute	Description
1	MICP	Input	Microphone+
2	MICN	Input	Microphone-

6.1.24. 12V Power input interface

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	12V	Power	+12V Input
4	12V	Power	+12V Input

6.1.25. MIC & Audio interface

The 4P socket of the headphone seat and the headphone seat is introduced with different signals along the same road, and this audio signal can only drive the headset;

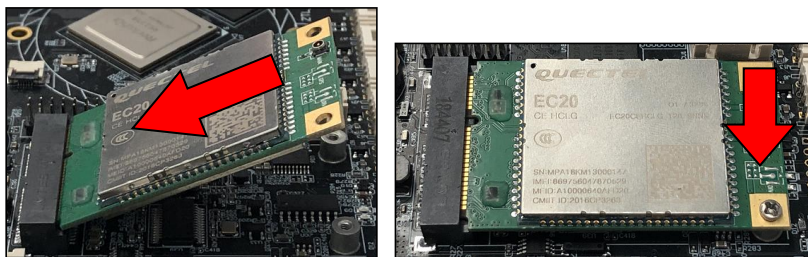
No.	Definition	Attribute	Description
1	PHR	Output	Outputs the R-channel audio signal
2	MIC	Input	Enter the L-channel audio signal
3	GND	Ground	Ground
4	PHL	Output	Output the L-channel audio signal

***If using the header as the audio input, determine the correct access method.**

6.1.26. 4G module socket

52P MINI PCI-E socket, is used for 4G module assembly(optional, can't connect to any other external device)

- ① According to the module model, record the corresponding software.
- ② Insert the gold finger of the module into the 4G module socket at an angle of 30 °
- ③ Insert the Micro-SIM card into the slot on back of the board.
- ④ Some IOT cards need to be configured with APN, please consult SIM card operator to obtain APN, and then add / configure



6.2. USB Explanation of External Power Supply

***Note: All USB power supplies should not exceed 3A in total;**

USB interface	GPIO	Straight out/HUB	electric current
USB1	GPIO1-A4-D	Straight out OTG	1.5A
USB2	GPIO1-A1-D	Straight out	1.5A
USB3	Uncontrollable	HUB	Share 2.5A
USB4	Uncontrollable	HUB	
USB5	Uncontrollable	HUB	
USB6	Uncontrollable	HUB	

6.3. Other standard interfaces and functions

name	Seat specifications	description
DC 12V Power supply interface	DC-5.5*2.5mm Terminal Female head	The 12V power supply input
Headphone seat interface	National standard earphones interface	1*microphone mono input (analog signal input), 1*audio dual channel output (analog signal output)
HDMI IN interface	Standard HDMI Female head	Supports up to 4K input
HDMI OUT interface	Standard HDMI Female head	Supports up to 8K output
TF card interface	Standard TF card interface	Up to 128GB of TF card expansion support
SIM card interface	Standard Micro SIM card interface	Support mobile / Unicom / Telecom full netcom
POWER key	Non self-locking button	POWER ON Push the key button
UBOOT&RESET key	Non self-locking button	Short press reset, long press upgrade
BOOT key	Non self-locking button	BOOT key
USB interface	Standard USB 3.0 double-layer interface	HOST mode supports data storage, data import, USB mouse and keyboard, camera, touch screen, etc.
USB OTG interface	Standard USB 3.0 double-layer	Support OTG / HOST mode switch, OTG mode can be software debugging,

	interface	firmware upgrade
1000M Ethernet interface	RJ45 interface	Support two ways 10 / 100 / 1000M adaptive Ethernet
Standard RTC battery interface	Support for real-time clock, 1220 button battery power supply	Standard RTC battery interface

7. Matters need attention

- Please wear electrostatic wristbands and other electrostatic protective tools when contacting the main board (you should have good grounding);
- Do not do live assembly, wiring and other operations;
- Please check the motherboard interface definition and peripheral interface definition, no error or reverse connection;
- Please fix the motherboard with M3 flat round head screws, do not use large gauge screws; pay attention to avoid motherboard deformation and bending when twisting screws;
- Pay attention to the matching of IO port, serial port, enabling foot and other levels;
- Pay attention to the power of the external screen, with large power, please consider the external power supply;
- Pay attention to the overall power of the product, and select the power supply with sufficient power;