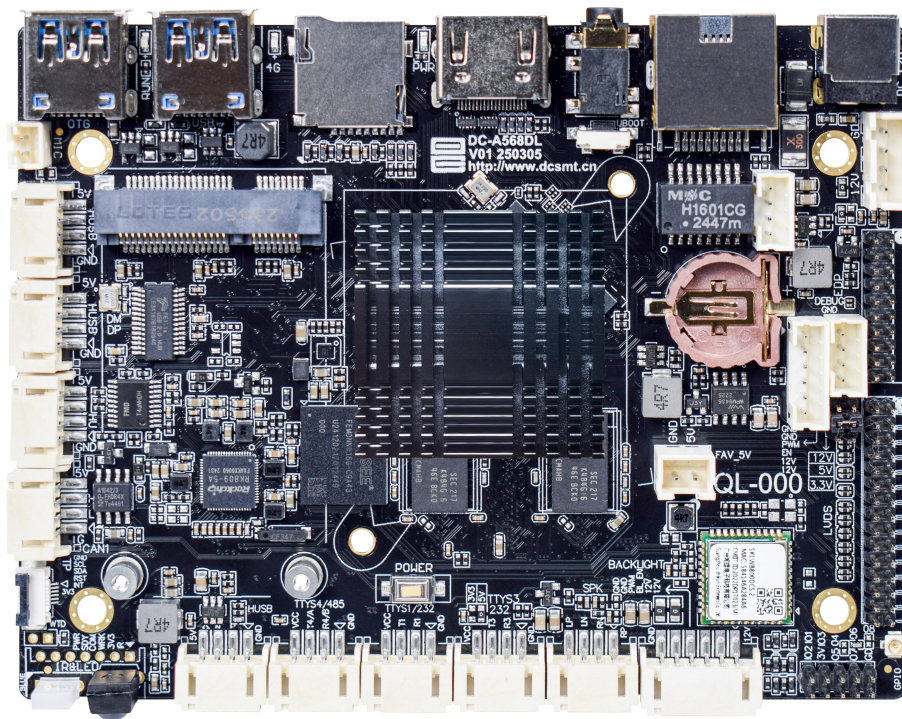


BTP-PCM-A-RK3568 (CAN) V01

Specification



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Chapter 1 Electrical Properties

1.1 Behaviour of Electricity

1.1.1 Standard Power Supply

class		Minimum	Typical case	Maximum
Standard power supply parameters	Voltage	11.4V	12V	12.6V
	Ripple wave	–	100mV	150mV
	Current	3A	5A	–
Power consumption of 12V boards connected only to HDMI	Quiescent dissipation	–	2.4W	–
	Sleep power consumption	–	2W	–
LVDS power supply output current (2×3 Pin)	3.3V operating current			0.8A
	5V operating current			0.8A
	12V operating current			0.8A
USB port 5V output total current	See Chapter 6.2 for details			
12V output current				2A

- ① **3. The total output current of 3V shall not exceed 3A;**
 - ② **The total output current of 5V does not exceed 3A;**
 - ③ **The LVDS backlight output current must not exceed 1.5A;**
 - ④ **The 12V power supply input is increased with the increase of the total power of peripheral devices, on the basis of ensuring a minimum current of 3A.
The 5 4G module PCIE interface is powered by 3.8V;**
-

Chapter 2 Product Overview

2.1 、 Summary

Powered by Rockchip's RK3568 main controller with a quad-core Cortex-A55 processor and the latest Arm v8.2-A architecture.

The architecture delivers enhanced performance. The Mail G52 2EE processor features a dual-core GPU supporting 4K and 1080P decoding, with CBR, VBR, FixQp, AVBR, and QpMap support, along with ROI encoding. Its graphics API supports OpenGL ES3.2, 2.0, 1.1, and Vulkan 1.1. Boasting a clock speed of up to 2.0GHz, the chip utilizes 22nm advanced manufacturing technology for low power consumption and high performance. Equipped with Rockchip's self-developed third-generation NPU RKNN, it achieves 0.8Tops of computing power, supporting

One-click conversion of mainstream architectures including Caffe, TensorFlow, TFLite, ONNX, PyTorch, Keras, and Darknet.

2.2 、 Characteristic

- ① High Performance: Featuring a Quad-Core A55 Architecture With a Clock Speed of up to 2.0 GHz, It Supports HD Decoding for Multiple Formats Including 4K, 264, and 265.
 - ② Multiple Display Interfaces: LVDS, HDMI, EDP, and Other Display Output Interfaces, Supporting Multi-Screen Display.
 - ③ Multiple Network Interfaces: Supports 2.4GHz/5GHz Dual-Band WiFi, 100Mbps Wired Ethernet, and 4G Wireless Network.
 - ④ Extensive Expansion Interfaces: Supports USB, TTL (RS232 and RS485 Optional), I2C, and CAN.
 - ⑤ Supports Android System, With System Optimization and Custom Development Capabilities. Provides Secondary Development Source Code Examples, Ideal for APK Development.
-

Chapter 4: Basic Features

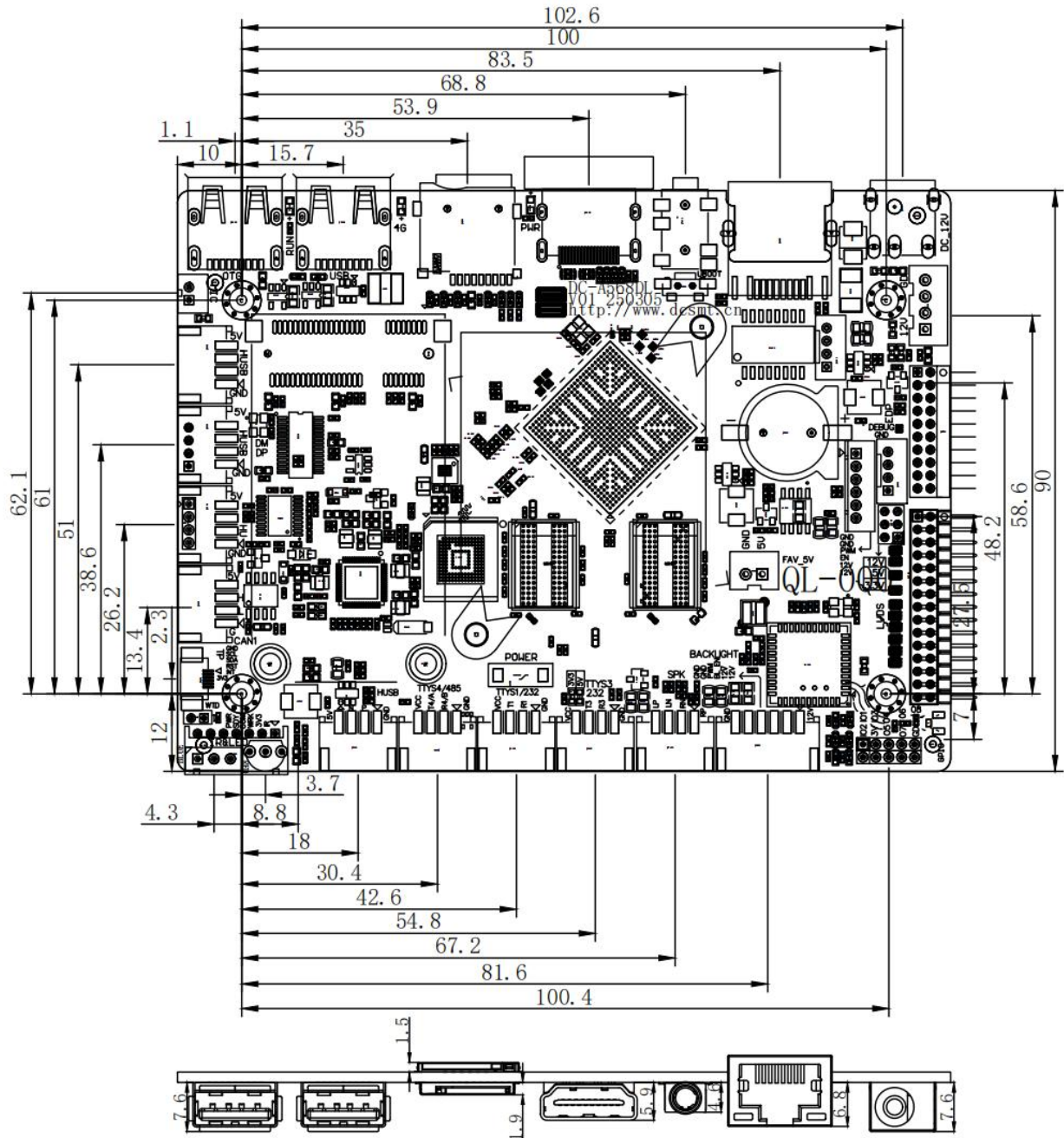
Core components	
CPU	RK3568, a quad-core 64-bit Cortex-A55 processor with a maximum clock speed of 2.0GHz
GPU	ARM G52 2EE, supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, built-in high-performance 2D acceleration hardware
Internal storage	DDR3 1GB/2GB/4GB
Flash memory	EMMC 8GB/16GB/32GB/64GB/128GB (optional)
Memory expansion	Supports up to 128GB TF card expansion
Display interface	
HDMI OUT port	HDMI2.0 supports up to 3840x2160 output
LVDS joggle	1 Supports LVDS interfaces (single-channel, 6-bit dual-channel, 8-bit dual-channel), with a maximum resolution of 1920×1080
EDP joggle	1 Maximum supported resolution: 1920×1080
Audio interface	
Headphone jack	1 One microphone mono input (analog signal input) and one audio stereo output (analog signal output)
Amplifier interface	Dual-channel output on both sides, supporting 8 Ω 10W dual speakers
Microphone interface	1 Luma microphone mono input (analog signal input)
Network Support	
Ethernet	1 One standard RJ45 port, one 2.0mm-4P connector, and 10/100M adaptive Ethernet
WIFI/ PDA	Built-in WIFI/BT module with dual-band WiFi 2.4GHz/5GHz and optional WiFi6 support. Compatible with 802.11a/b/g/n/ac protocols and Bluetooth 4.0 (BLE).
Mobile network	1 Built-in MINI PCIe expansion slot for 3G/4G module
Basic interface	
USB 2.0	5 A USB Host interface (1 external standard USB 3.0 port and 42.0mm-4P connectors) for connecting external devices such as HD USB cameras, USB drives, keyboards, and mice.
USB OTG	1 A USB OTG port for debugging the system, updating firmware, and setting to Host mode
Gorge line	4 Serial ports, including 3 TTL ports (2 optional RS232 serial ports, 1 optional RS485 serial port), and 1 TTL debugging serial port
GPIO mouth	8 One IO port, supporting input and output
CAN mouth	1 One CAN port

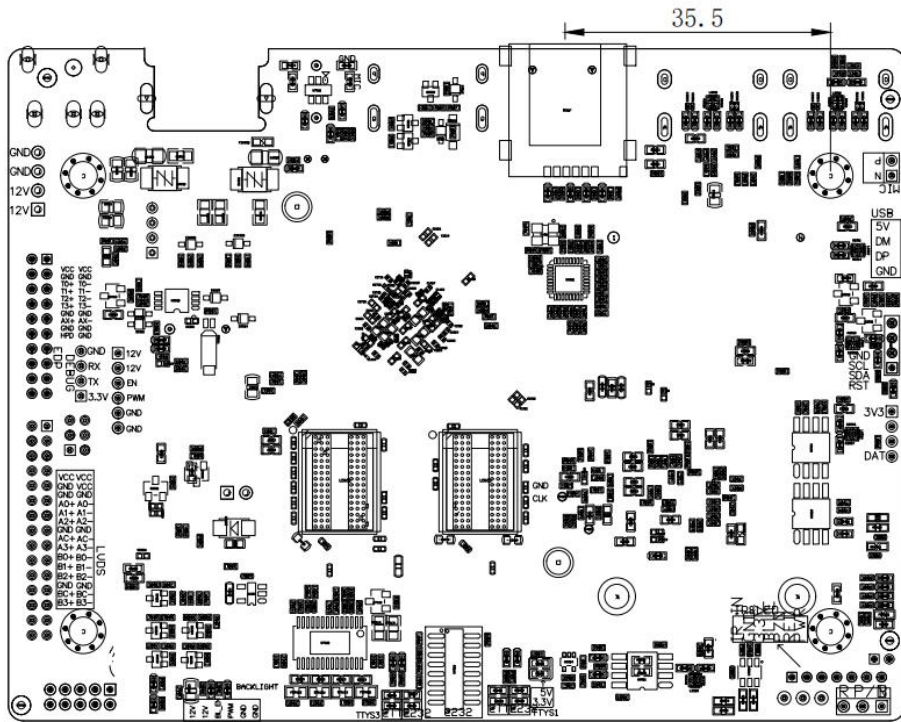
Built-in RTC	Supports real-time clock, powered by 1220 button battery
IIC joggle	1 The standard I2C interface on the road can be used for touch and communication
Scheduled on/off	Apolegamy
Hardware watchdog	Apolegamy
Infrared reception	Apolegamy
Remote infrared power on	Apolegamy
Other	
Operating system	Android 11
Convenience receptacle	1 One external DC12V input socket (DC-5.5*2.5mm female connector) and one 2.54mm-4P input socket
Recommended power specifications	12V 2-5A (select according to peripheral power)
System upgrade	Supports PC, U disk, and TF card upgrades
Work environment	
Working temperature	0°C~70°C, recommended 5°C~35°C
Working humidity	10% to 90%, no condensation
Storage temperature	-30°C~75°C, recommended for storage at room temperature

Chapter 5: Mainboard Specifications

5.1 PCB Dimensions

unit : mm





5.2 Specifications

Mainboard size: 120*92*12mm

Mainboard height: $\leq 8\text{mm}$ on the front and $\leq 3\text{mm}$ on the back

Number of PCB layers: 6

PCB size: 120*90*1.6mm

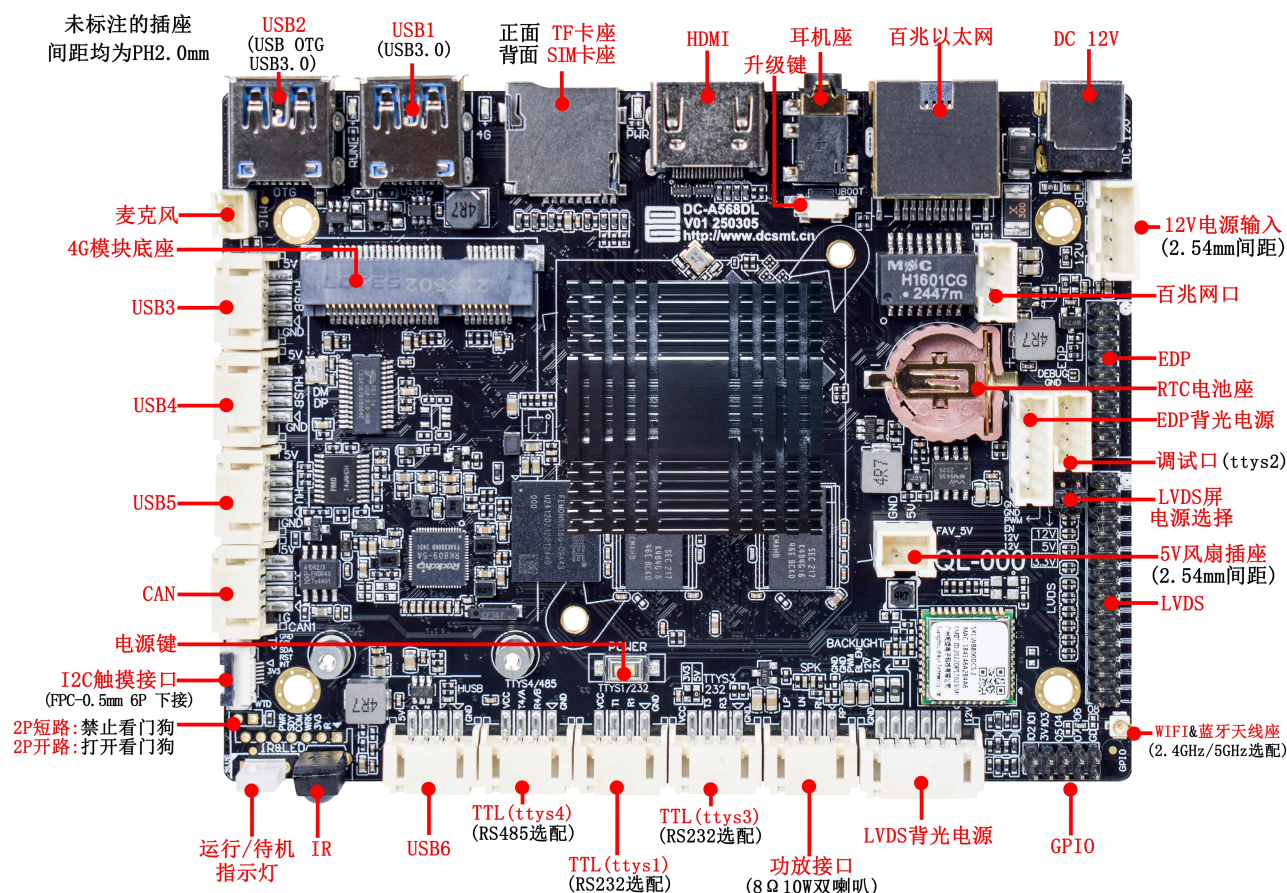
PCB color: black

PCB process: Gold plating

Screw hole size: $\Phi 3.5\text{mm} * 4$

Chapter 6 Interface Definition

6.1、 Interface Specification



***Note: Except for the switch-mode power supply interface and DC interface, all other interfaces cannot connect power input. The first pin of the socket interface is defined by the "▼" character or "■" pad.**

6.1.1 Microphone Interface

Order number	Definition	attribute	description
1	N	Import	Microphone input negative
2	P	Import	Microphone input positive

6.1.2、 USB Joggle

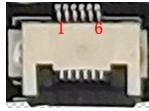
Order number	Definition	attribute	description
1	GND	Earth wire	Earth wire
2	DP	output	USB cable positive terminal
3	DM	output	USB data cable negative
4	5V	Source	+5V output, maximum output current is 500 mA

6.1.3、 CAN Joggle

Order number	Definition	attribute	description
1	GND	Ground wire	Earth wire

2	CANL	output	CANL signal wire
3	CANH	Import	CANH signal wire
4	5V	Source	+5V output, maximum output current is 500 mA

6.1.4, I2C Touch Interface



Order number	Definition	attribute	description	Voltage range
1	GND	Earth wire	Earth wire	
2	SCL1	output	I2C1 clock line	3.3V
3	SDA1	output	I2C1 data line	3.3V
4	TP_RST	Input/Output	Touchscreen reset signal (GPIO0_B6_u)	3.3V
5	TP_INT	Input/Output	Touchscreen interrupt signal (GPIO0_B5_u)	3.3V
6	3.3V	Power output	+3.3V output, maximum output current 500mA	

6.1.5 LED/IR Interface

Order number	Definition	attribute	description
1	IR_IN	Import	External infrared probe signal input
2	GND	Earth wire	Earth wire
3	3.3V	Source	+3.3 output
4	BLUE	Pilot lamp	Work indicator light
5	GND	Earth wire	Earth wire
6	RED	Pilot lamp	Standby indicator
7	PWR	Import	Switch control line, single low pull

*** The indicator light is connected with a common cathode, the positive pole is connected to the corresponding indicator light pin, and the negative pole is connected to the ground;**

6.1.6, TTL Interface (Serial Port 4)

Order number	Definition	attribute	description
1	GND	Earth wire	Earth wire
2	B/RX4	Import	Serial Port 4 Data Reception (TTL)
3	A/TX4	output	Serial Port 4 Data Transmission (TTL)
4	3.3V	Source	+3.3V output, maximum output current 500 mA

***Serial port 4 node is tty s4;**

Default TTL serial port, optional RS485 serial port;

6.1.7, TTL Interface (Serial Port 1/Serial Port 3)

Order number	Definition	attribute	description
1	GND	Earth wire	Earth wire
2	RX1/RX3	Import	Serial Port 1/Serial Port 3 Data Reception (TTL)
3	TX1/TX3	output	Serial Port 1/3 Data Transmission (TTL)
4	3.3V	Source	+3.3V output (RS232 is 5V), maximum output current is 500mA

*** Serial port 1 node is tty s1, serial port 3 node is tty s3;**

Default TTL serial port, optional RS232 serial port;

6.1.8 Power Amplifier Interface

This audio signal is amplified by the built-in amplifier. It is recommended to connect an external **8 Ω 10W** dual speaker;

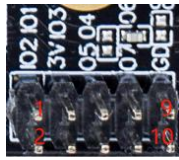
Order number	Definition	attribute	description
1	RP	output	Output R+ audio power amplifier signal
2	RN	output	Output R-Audio power amplifier signal
3	LN	output	Output L-Audio power amplifier signal
4	LP	output	Output L+ audio power amplifier signal

6.1.9 LVDS Backlight Power Interface

The LVDS display requires a backlight power supply with a maximum 1.5A current at 12V. For 19-inch or larger displays or those with 20W+ backlight power, use an external power supply to prevent system instability. The backlight enable voltage is 3.3V; if different voltage is needed, add an IO level conversion circuit. This 12V power supply must exclusively serve as backlight output and should never be used as motherboard input.

Order number	Definition	attribute	description
1	12V	Source	+12V output
2	12V	Source	+12V output
3	BL_EN	output	Backlight enable signal (3.3V)
4	PWM4	output	Backlight brightness adjustment signal (0-5V)
5	GND	Earth wire	Earth wire
6	GND	Earth wire	Earth wire

6.1.10 GPIO Interface



Order number	Definition	attribute	Default up/down pull	description	Voltage range
1	I01	Input/Output	High pull	GPI01_A1_u	3.3V
2	I02	Input/Output	Drop-down	GPI03_A5_d	3.3V
3	I03	Input/Output	High pull	GPI01_A0_u	3.3V
4	3.3V	Source		+3.3V output	
5	I04	Input/Output	Drop-down	GPI03_A3_d	3.3V
6	I05	Input/Output	Drop-down	GPI02_D0_d	3.3V
7	I06	Input/Output	Drop-down	GPI02_D1_d	3.3V
8	I07	Input/Output	Drop-down	GPI03_A6_d	3.3V
9	I08	Input/Output	Drop-down	GPI03_A4_d	3.3V
10	GND	Earth wire		Earth wire	

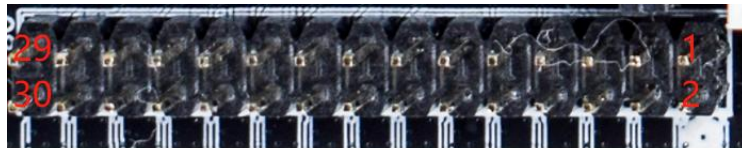
6.1.11 5V Fan Port

Order number	Definition	attribute	description
1	5V	Source	+5V output, maximum output current is 500 mA
2	GND	Earth wire	Earth wire

6.1.12 LVDS Interface

A universal LVDS interface specification supporting 1080P LVDS displays with single/dual, 6-bit/8-bit configurations.

Note: This interface is for LVDS display only. Check the display specifications to ensure the interface definition matches the voltage. Adjust the cable sequence if necessary.



Order number	Definition	attribute	description
1	VCC	Source	The power supply outputs +3.3V, +5V, and +12 V are selected by jumper.
2	VCC	Source	The power supply outputs +3.3V, +5V, and +12 V are selected by jumper.
3	VCC	Source	The power supply outputs +3.3V, +5V, and +12 V are selected by jumper.
4	GND	Earth wire	Ground wire
5	GND	Earth wire	Earth wire
6	GND	Earth wire	Earth wire
7	A0-	output	Data channel
8	A0+	output	Data channel
9	A1-	output	Data channel
10	A1+	output	Data channel
11	A2-	output	Data channel
12	A2+	output	Data channel
13	GND	Earth wire	Earth wire
14	GND	Earth wire	Earth wire
15	AC-	output	Data channel
16	AC+	output	Data channel
17	A3-	output	Data channel
18	A3+	output	Data channel
19	B0-	output	Data channel
20	B0+	output	Data channel
21	B1-	output	Data channel
22	B1+	output	Data channel
23	B2-	output	Data channel
24	B2+	output	Data channel
25	GND	Earth wire	Earth wire
26	GND	Earth wire	Earth wire
27	BC-	output	Data channel
28	BC+	output	Data channel
29	B3-	output	Data channel
30	B3+	output	Data channel

6.1.13 LVDS Display Power Interface

Select the LVDS screen power supply voltage. The screen voltage can be selected by plugging in the 2.0mm jumper cap. It supports 3.3V/5V/12V screen power supply. If 5V is selected, the jumper cap should be inserted into the two pins marked with a red frame.

To avoid burning the motherboard and screen, please note the following:

1. Verify that the display's power supply voltage meets the specifications and that the board's power supply can handle its maximum operating current.
2. Use a multimeter to verify that the power supply selected by the jumper cap is correct.
3. Do not connect power supplies to each other, otherwise the motherboard will be damaged.
4. The maximum current is 800mA, and the instantaneous current cannot exceed 5A.



Order number	Definition	attribute	description	Order number	Definition	attribute	description
6	VCC	Source	LVDS screen voltage	5	12V	Source	+12V
4	5V	Source	+5V	3	VCC	Source	LVDS screen voltage
2	VCC	Source	LVDS screen voltage	1	3.3V	Source	+3.3V

6.1.14 Debugging Port Interface

Order number	Definition	attribute	description
1	3.3V	Source	+3.3V output
2	TX	Import	Serial Port 2 Data Transmission (TTL)
3	RX	output	Serial Port 2 Data Reception (TTL)
4	GND	Earth wire	Earth wire

This interface is configured as a system debugging port (not a software debugging port). You can change it to a standard serial port. For assistance, please contact the sales team.

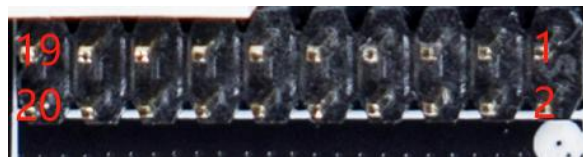
*** The serial port 2 node is tty s2;**

6.1.15 EDP Backlight Power Interface

The backlight power supply for EDP screens must have a current of no more than 1.5A at 12V. When using screens larger than 19 inches or those with backlight power exceeding 20W, the backlight power should be drawn from another power board to prevent system instability. The backlight enable voltage is 3.3V. If different voltage levels are required, add an IO level conversion circuit. This 12V power supply must only serve as a backlight output and must never be used as a motherboard input.

Order number	Definition	attribute	description
1	12V	Source	+12V output
2	12V	Source	+12V output
3	BL_EN	output	Backlight enable signal (3.3V)
4	PWM2	output	Backlight brightness adjustment signal (0-5V)
5	GND	Earth wire	Earth wire
6	GND	Earth wire	Earth wire

6.1.16、 EDP Joggle



Note: This interface is for connecting to an EDP screen only. Check the screen specifications to ensure the interface definition matches the voltage. If not, adjust the wire sequence.

Order number	Definition	attribute	description
1	VCC	Source	The power supply outputs +3.3V/+5V through a resistor selection, with 3.3V as the default.
2	VCC	Source	The power supply outputs +3.3V/+5V through a resistor selection, with 3.3V as the default.
3	GND	Earth wire	Earth wire
4	GND	Earth wire	Earth wire
5	T0-	output	Data channel
6	T0+	output	Data channel
7	T1-	output	Data channel

8	T1+	output	Data channel
9	T2-	output	Data channel
10	T2+	output	Data channel
11	T3-	output	Data channel
12	T3+	output	Data channel
13	GND	Earth wire	Earth wire
14	GND	Earth wire	Earth wire
15	AX-	output	Data channel
16	AX+	output	Data channel
17	GND	Earth wire	Earth wire
18	GND	Earth wire	Earth wire
19	GND	Earth wire	Earth wire
20	HPD	/	/

6.1.17 12V Power Input Interface

Order number	Definition	attribute	description
1	12V	Source	+12V input
2	12V	Source	+12V input
3	GND	Earth wire	Earth wire
4	GND	Earth wire	Earth wire

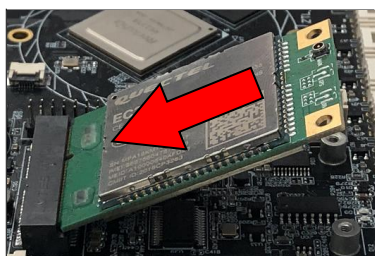
6.1.18 100 Mbps Network Port Interface

Order number	Definition	attribute	description
1	T+	output	Network port data transmission is in progress
2	T-	output	Negative network port data transmission
3	R+	Import	Network port data reception is in progress
4	R-	Import	Negative network port data reception

6.1.19 4G Module Base

52P MINI PCIE socket for installing a 4G module (optional, no other peripherals allowed). Network operation is as follows:

- ① According to the Module Model, Flash the Corresponding Firmware (currently Supports Quectel EC20, Huawei ME909S, Etc.);
- ② Insert the Module's Gold Fingers at a 30° Angle Into the 4G Module Base, Then Secure With 1 or 2 M2×4 Metric Flat-Head Screws.
- ③ Insert the Micro-SIM Card Into the Rear Card Slot of the Motherboard With the **SIM Card Notch Facing Inward**.
- ④ Some IoT Cards Require APN Configuration. Contact Your SIM Card Provider to Obtain the APN and Then Add or Configure It.



6.2 USB Port Power Supply Instructions

***Note: The total USB power supply should not exceed 3A;**

USB jog- gle	GPIO	Go straight to HUB	Current
USB1	USB_CON_PWREN_H GPIO0-A6-D	Go straight	1. 5A
USB2	GPIO0-A5-D	USB OTG Direct	1. 5A
USB3	USB_CON_PWREN_H GPIO0-A6-D	HUB	Shared 2.5A
USB4	USB_CON_PWREN_H GPIO0-A6-D	HUB	
USB5	USB_CON_PWREN_H GPIO0-A6-D	HUB	
USB6	USB_CON_PWREN_H GPIO0-A6-D	HUB	

6.3 Other Standard Interfaces and Functions

Name	Seat specifications	description
DC 12V power in- terface	DC-5.5×2.5mm female connector	12V power input
100 Mbps Ethernet interface	RJ45 port	Supports 10/100M adaptive Ethernet throu- ghout the path
Headphone jack	US standard headphone jack	1 One microphone input (analog signal) and one audio output (analog signal);
Upgrade button	Non-self-locking button	UBOOT key
HDMI joggle	Standard HDMI female connector	Supports up to 3840x2160 output
TF cassette	Standard TF card slot	Supports up to 128GB of TF card expansion
SIM cassette	Standard SIM card slot	Supports all networks: Mobile, Unicom, and Telecom
USB joggle	Standard USB3.0 port	The HOST mode supports data storage, data import, USB mouse and keyboard, camera, touch screen, and more.
USB OTG port	Standard USB3.0 port	Supports switching between OTG and HOST modes. In OTG mode, you can debug softw- are and upgrade firmware.
Power switch	Non-self-locking button	For turning on and off
RTC battery holder	Standard RTC Battery Case	Supports real-time clock, powered by 1220 button battery
WIFI antenna pe- destal	IPEX Public	Supports dual-band WiFi 2.4GHz/5GHz
Work indicator li- ght	LED lamp	Blue light indicates running, red light indica- tes shutdown