TECHNICAL DATASHEET

for

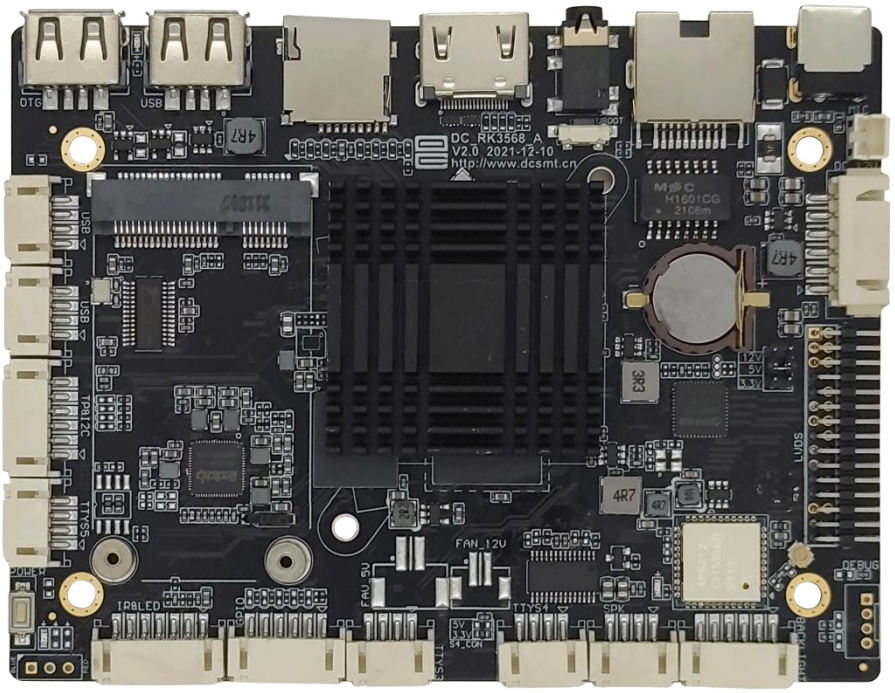
Android PC Board

Part No.	Configuration
BTP-PCM-RK3568V2.0-2.16	2G Memory+16G Flash Memory
BTP-PCM-RK3568V2.0-4.16	4G Memory+16G Flash Memory
BTP-PCM-RK3568V2.0-4.32	4G Memory+32G Flash Memory

All datasheet provided by Sinotectronics BTP Product team, in case of any question, please feel free to contact us: info@sinotectronics.com

Android PC Module

Part No.: BTP-PCM-A-RK3568 V2.0



Version	Date	Modification
V1.0	2022-2-17	The first version
V1.1	2022-5-19	Modify serial port description
V1.2	2022-6-9	Modify MIPI screen power supply voltage
V1.3	2022-6-14	Modify GPIO description

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1. Introduction

1.1 Description

By adopting Rockchip RK3568 main control, quad-core Cortex-A55 processor, and a new Arm v8.2-A architecture, DC_RK3568_A_V2.0 effectively improved its performance. Mail G52 2EE dual-core GPU supports 4K decoding and 1080P decoding; supports CBR, VBR, FixQp, AVBR, and QpMap, supports ROI encoding. Image API supports OpenGL ES3.2, 2.0, 1.1, Vulkan1.1. Main frequency is up to 2.0GHz; 22nm advanced technology with low power consumption and high performance; Built-in Rockchip's self-developed third-generation NPU RKNN, with a computing power of 0.8Tops, supports one-click conversion of Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darknet mainstream architecture models.

1.2 Features

High Performance: adopts the quad-core A55 solution, the main frequency is up to 2.0GHz, and supports 4KH.264/H.265 and other high-definition decoding formats.

Multiple Display Interfaces: LVDS, HDMI, MIPI multiple display output interfaces, support multi-screen different display.

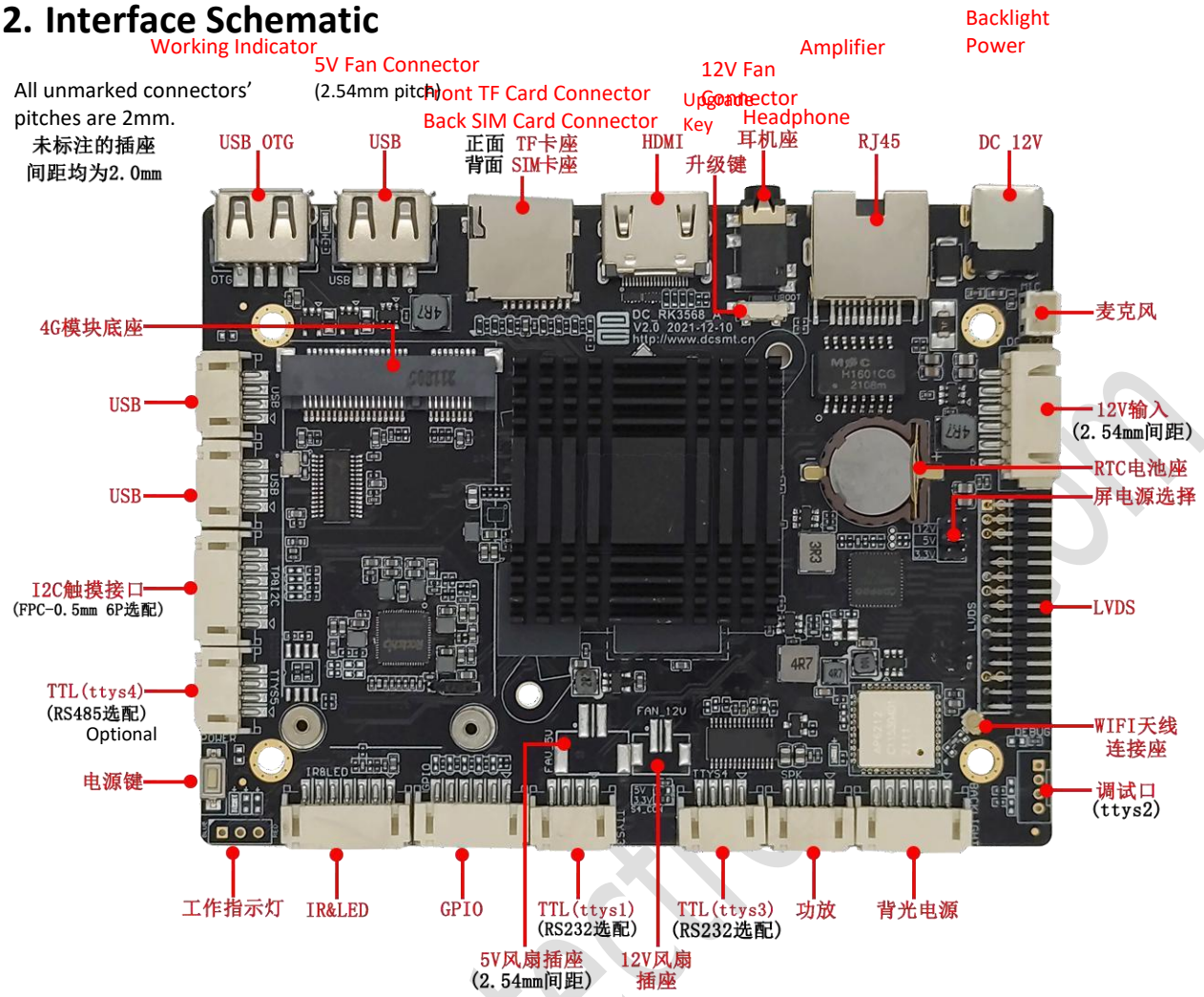
Multiple Network Interfaces: supports 2.4GHz/5GHz dual-band WiFi, wired 100M Ethernet, 4G wireless network.

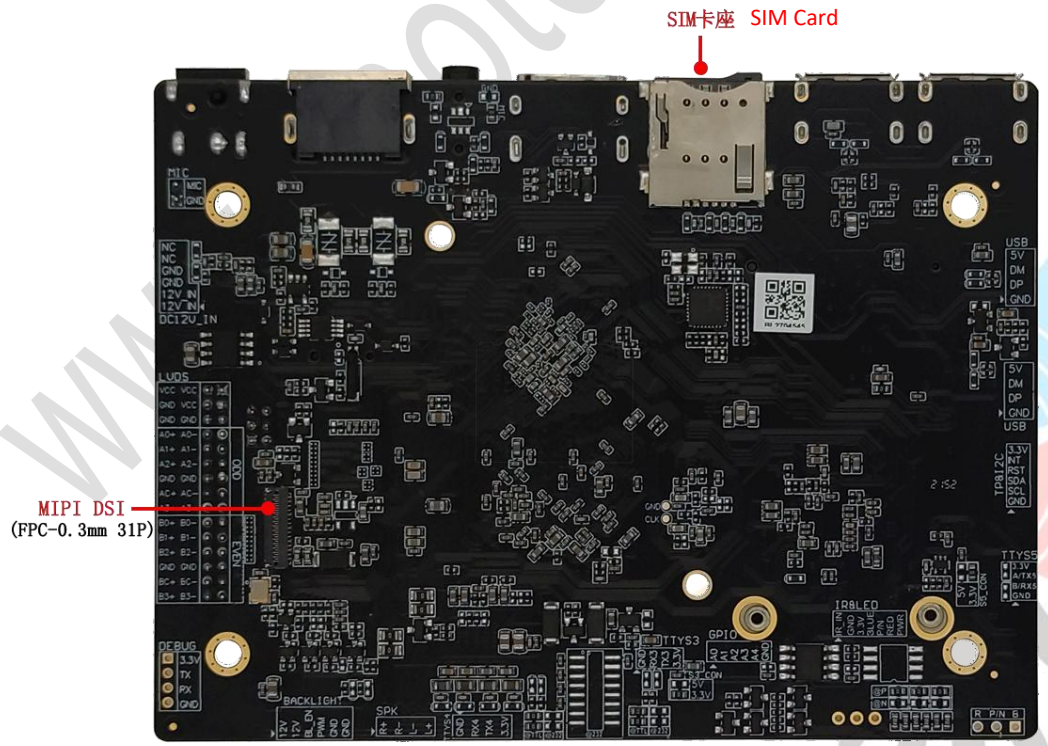
Rich Expansion Interfaces: supports USB, TTL (optional RS232, RS485), IIC expansion interface.

Supports Android, linux system; system optimization, development customization; provides secondary development source code examples, suitable for APK development.

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2. Interface Schematic





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3. Basic Functions

Core Elements	
CPU	RK3568, 2.0GHzQuad-core 64-bit Cortex-A55, main frequency up to 2.0GHz
GPU	ARM G52 2EE， supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, embedded high-performance 2D acceleration hardware
Memory	LPDDR4X 1GB/2GB (default) /4GB/8GB
Flash Memory	EMMC 8G (default) /16/32G/64G/128GB (optional)
Memory Expansion	Supports up to 128GB TF card expansion
Display Interfaces	
HDMI OUT	HDMI2.0 supports Max. 3840x2160 output
LVDS	1*LVDS interface (single, 6-bit dual, 8-bit dual), max. resolution 1920×1080
MIPI DSI	1*MIPI DSI, max. resolution 1920×1080
Audio Interfaces	
Headphone	1-channel microphone mono input (analog signal input), 1-channel audio dual channel output (analog signal output)
Amplifier	Left and right dual channel output, supports 8Ω 10W dual speakers
Microphone	1-channel microphone mono input (analog signal input)
Network	
Ethernet	1 standard RJ45 interface, 10/100M adaptive Ethernet
WIFI/Bluetooth	Onboard WIFI/BT module, supports WiFi 2.4GHz/5GHz (optional 5GHz), supports 802.11a/b/g/n/ac protocol, 4.0 Bluetooth (supports BLE)
Mobile Network	1 built-in MINI PCI_E connector, expansive 3G/4G module
Basic Interfaces	
USB 2.0	3*USB Host interfaces (1*external standard USB, 2* 2.0mm-4P connectors), used for external high-definition USB camera, U disk, keyboard and mouse, etc.
USB OTG	1*USB OTG interface for debugging system, updating firmware, can be set as Host mode
Serial Port	4 serial ports, of which 3 are TTL (2 can be configured as RS232 serial ports, 1 can be configured as RS485 serial port), 1 TTL debugging serial port
GPIO	5*IO ports, supports input and output

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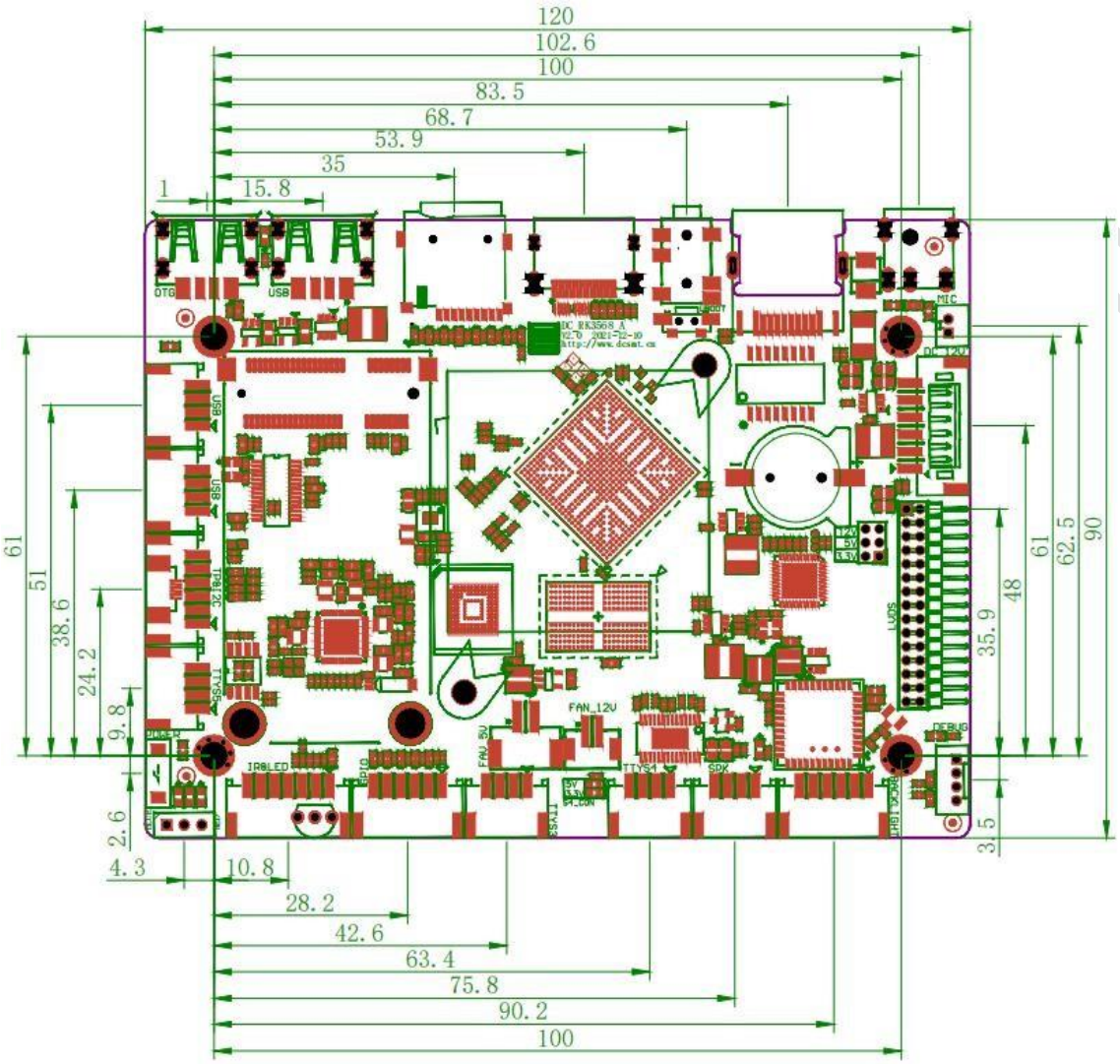
Onboard RTC	Supports real-time clock, can be powered by 1220 button battery
Timer Switch	Support
IIC	2 standard IIC interfaces, one of which can be used for touch, communication
Infrared Receiver	1 infrared receiver, which supports infrared remote control function
Others	
Operating System	Android 11 (default)/debian/ubuntu18.04/ubuntu20.04/buildroot
Power	1 external DC12V input (DC-5.5*2.5MM female), one 2.54mm-6P input
Recommended Power Specification	12V 2-5A (according to peripheral power)
System Upgrade	Supports PC/U disk/TF card upgrade
Operating Environment	
Operating Temperature	0℃～70℃, 5℃～35℃ suggested
Operating Humidity	10％～90％, no condensation
Storage Temperature	-30℃～75℃, recommended room temperature

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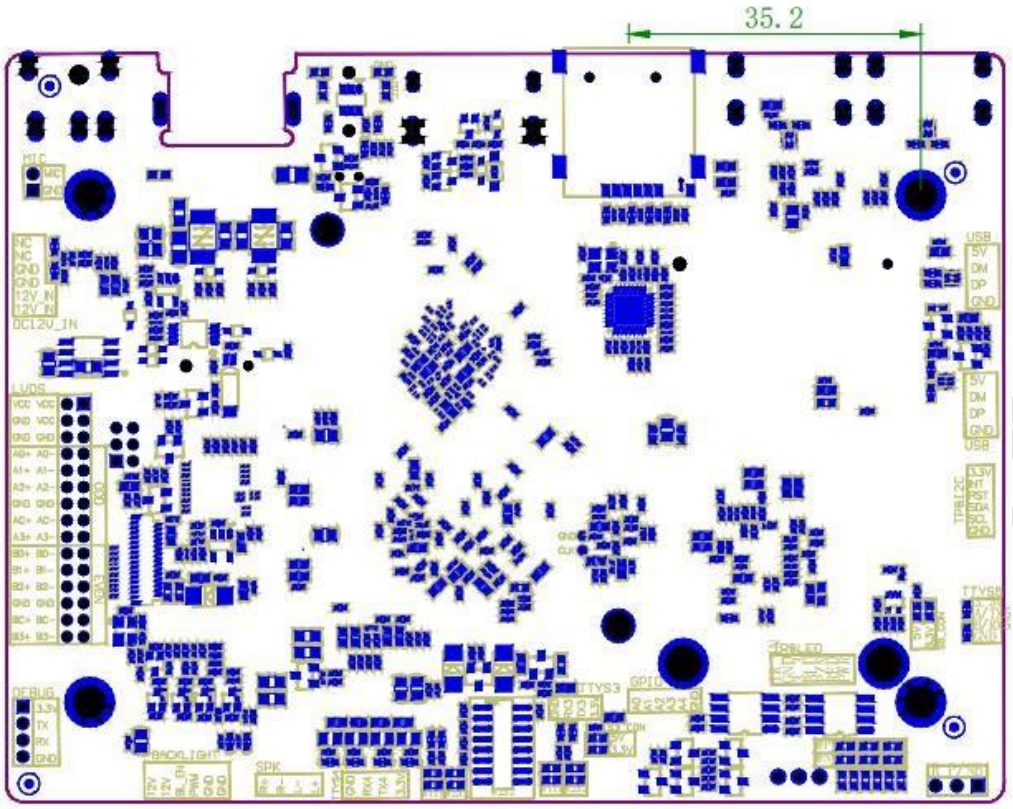
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4. Dimension

4.1 Dimension Figure



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4.2 Parameters

Motherboard Dimension: 92*120*14mm

Height: Front ≤ 11mm, Back ≤ 3mm

PCB layers: 6

PCB Dimension: 90*120*1.6mm

PCB Color: Black

PCB Craft: sinking gold

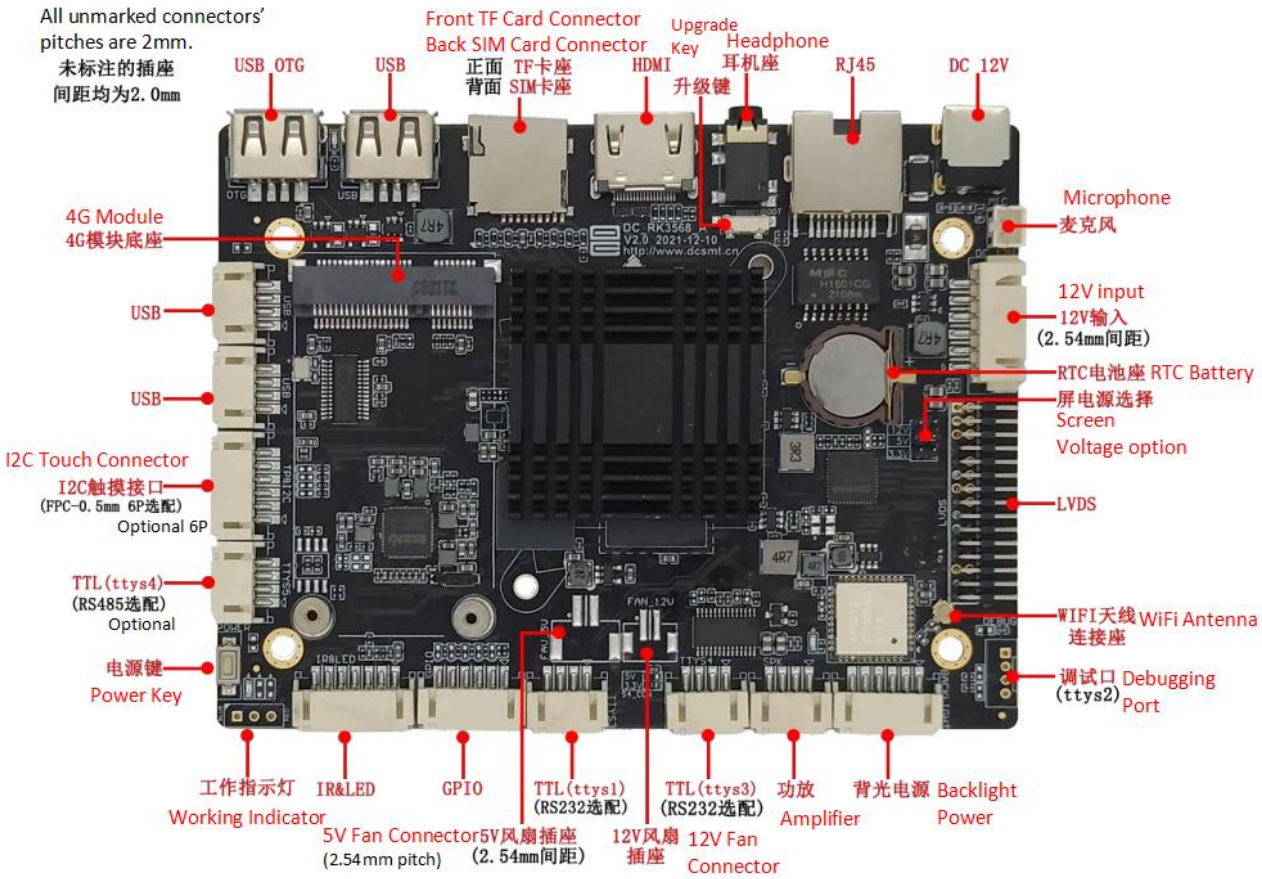
Screw Hole: Φ3mm*4

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5. Interface Definitions

5.1 Interface Description



*Note: Except for the switching power supply interface and DC interface, others cannot be connected to the power input; "▼" is the first pin of the connector definition.

① USB

No.	Definition	Attribute	Description
1	GND	Ground Wire	Ground Wire
2	DP	Output	USB cable+
3	DM	Output	USB cable-
4	5V	Power	+5V Output

② IIC Touch

No.	Definition	Attribute	Description
1	GND	Ground Wire	Ground Wire
2	SCL	Input/Output	I2C1 clock wire
3	SDA	Input/Output	I2C1 data wire

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4	RST	Input/Output	Touch screen reset signal
5	INT	Input/Output	touch screen interrupt signal
6	3.3V	Power Output	+3.3V Output

*PH2.0mm-6P connector by default, and the FPC-0.5mm 6P connector is optional.

③ TTL(serial port 4)

No.	Definition	Attribute	Description
1	GND	Ground Wire	Ground Wire
2	B/RX4	Output	Serial port 4 data sending (TTL)
3	A/TX4	Input	Serial port 4 data receiving (TTL)
4	3.3V	Power	+3.3V Output

*The serial port 4 node is ttys4;

*TTL serial port by default, optional RS485 serial port.

④ LED/IR

No.	Definition	Attribute	Description
1	IR_IN	Input	External infrared probe signal input
2	GND	Ground Wire	Ground Wire
3	3.3V	Power	+3.3 Output
4	BLUE	Indicator	Working Indicator
5	3.3V	Power	+3.3V Output
6	RED	Indicator	Standby Indicator
7	PWR	Input	Switch machine control wire, single pull down is effective

*Indicator uses a common anode connection, connect the positive pole to 3.3V, and connect the negative pole to the corresponding indicator pin.

⑤ GPIO

No.	Definition	Attribute	Description	Voltage Domain
1	A0	Input/Output	GPIO1_A1_u (default) GPIO3_A6_d (optional)	3.3V
2	A1	Input/Output	GPIO1_A0_u	3.3V
3	A2	Input/Output	GPIO3_A3_d	3.3V
4	A3	Input/Output	GPIO3_A5_d	3.3V
5	A4	Input/Output	GPIO3_A4_d	3.3V

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6	GND	Ground Wire	Ground Wire	GND

⑥ 12V Fan

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

*Without this terminal by default

⑦ 5V Fan

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

*Without this terminal by default

⑧ TTL (Serial Port 1/Serial Port 3)

No.	Definition	Attribute	Description
1	GND	Ground Wire	Ground Wire
2	RX1/RX3	Input	Serial Port 1/Serial Port 3 data reception (TTL)
3	TX1/TX3	Output	Serial Port 1/Serial Port 3 data sending (TTL)
4	3.3V	Power	+3.3V Output

*Serial Port 1 node is ttys1, Serial Port 3 node is ttys3;

*TTL Serial Port by default, optional RS232 Serial Port;

⑨ Amplifier

The audio signal is amplified by the built-in amplifier, and it is recommended to connect an external 8Ω 10W dual speaker.

No.	Definition	Attribute	Description
1	R+	Output	Output R+Audio Amplifier Signal
2	R-	Output	Output R-Audio Amplifier Signal
3	L-	Output	Output L-Audio Amplifier Signal
4	L+	Output	Output L+Audio Amplifier Signal

⑩ Backlight Power

It is used for backlight power supply of LVDS screen. The 12V power supply current is not more than 1.5A. When using a large screen of 19 inches or more or the power of the backlight of LCD is above 20W, the backlight power supply should be powered from other power boards to avoid system instability. The backlight enable voltage is 3.3V, if other voltages are required, please add an IO level conversion circuit. This 12V power can only be used as backlight power output, and

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must not be used as power input for the motherboard.

No.	Definition	Attribute	Description
1	12V	Power	+12V Output
2	12V	Power	+12V Output
3	BL_EN	Output	Backlight enable signal (3.3V)
4	PWM1	Output	Backlight brightness adjustment signal (0-5V)
5	GND	Ground Wire	Ground Wire
6	GND	Ground Wire	Ground Wire

11 Debug Port

No.	Definition	Attribute	Description
1	3.3V	Power	+3.3V Output
2	TX	Input	Serial Port 2 data sending (TTL)
3	RX	Output	Serial Port 2 data reception (TTL)
4	GND	Ground Wire	Ground Wire

*This interface is the system debugging port by default (not the software debugging port), which can be changed to a normal serial port, please contact us if necessary;

*Serial Port 2 node is ttys2.

12 LVDS

Universal LVDS interface definition, supports single/dual, 6/8-bit 1080P LVDS screen;

Note: This interface is only used to connect to the LVDS screen, please check the screen specification to confirm whether the interface definition is consistent with the voltage, if not, please adjust the wire sequence.



No.	Definition	Attribute	Description
1	VCC	Power	Screen Power Output, +3.3V/+5V/+12V selected by wire sequence
2	VCC	Power	Screen Power Output+3.3V/+5V/+12V selected by wire sequence
3	VCC	Power	Screen Power Output+3.3V/+5V/+12V selected by wire sequence
4	GND	Ground Wire	Ground Wire
5	GND	Ground Wire	Ground Wire
6	GND	Ground Wire	Ground Wire
7	A0-	Output	Data Channel

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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	Ground Wire	Ground Wire
14	GND	Ground Wire	Ground 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	Ground Wire	Ground Wire
26	GND	Ground Wire	Ground Wire
27	BC-	Output	Data Channel
28	BC+	Output	Data Channel
29	B3-	Output	Data Channel
30	B3+	Output	Data Channel

13 Screen Power

It is used to select the power supply voltage of the LVDS screen. 3.3V/5V/12V screen voltage can be selected by inserting a 2.0mm wire selecting cap. If 5V is needed, please insert the cap to the two pins of 5V. In order to avoid burning the motherboard and screen, please pay attention to the following:

1. Please check the LCD screen specification to confirm whether the screen voltage is correct, and whether the corresponding power of the board can meet the maximum working current of the screen.

2. Please use a multimeter to confirm whether the power selected by the cap is correct.

3. Do not connect each power, otherwise the motherboard will be damaged.



No.	Definition	Attribute	Description	No.	Definition	Attribute	Description
6	VCC	Power	LVDS screen voltage	5	12V	Power	+12V
4	5V	Power	+5V	3	VCC	Power	LVDS screen voltage

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2	VCC	Power	LVDS screen voltage	1	3.3V	Power	+3.3V

14 12V Input

No.	Definition	Attribute	Description
1	12V_IN	Power	+12V Input
2	12V_IN	Power	+12V Input
3	GND	Ground Wire	Ground Wire
4	GND	Ground Wire	Ground Wire
5	NC	-	-
6	NC	-	-

15 Microphone

No.	Definition	Attribute	Description
1	GND	Ground Wire	Ground Wire
2	MIC	Input	Microphone Input

16 MIPI_DSI



Note: This interface can be used to connect to a MIPI screen. Please check the screen specification to confirm whether the interface definition is consistent. If it is not consistent, a converter board can be used. Please contact us for details.

Before inserting the cable, please confirm the direction of the cable (upper connection/bottom connection) to avoid damage to the LCD and motherboard.

No.	Definition	Attribute	Description
1	VCC_LEDA	Power	Backlight power positive voltage
2	VCC_LEDA	Power	Backlight power positive voltage
3	VCC_LEDA	Power	Backlight power positive voltage
4	NC	-	-
5	VCC_LEDK	Power	Backlight power negative voltage
6	VCC_LEDK	Power	Backlight power negative voltage
7	VCC_LEDK	Power	Backlight power negative voltage
8	VCC_LEDK	Power	Backlight power negative voltage
9	GND	Ground Wire	Ground Wire
10	GND	Ground Wire	Ground Wire
11	MIPIDSI_TX1_D2_P	Output	Data Channel
12	MIPIDSI_TX1_D2_N	Output	Data Channel
13	GND	Ground Wire	Ground Wire
14	MIPIDSI_TX1_D1_P	Output	Data Channel

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15	MIPIDSI_TX1_D1_N	Output	Data Channel
16	GND	Ground Wire	Ground Wire
17	MIPIDSI_TX1_CLK_P	Output	Data Channel Clock
18	MIPIDSI_TX1_CLK_N	Output	Data Channel Clock
19	GND	Ground Wire	Ground Wire
20	MIPIDSI_TX1_D0_P	Output	Data Channel
21	MIPIDSI_TX1_D0_N	Output	Data Channel
22	GND	Ground Wire	Ground Wire
23	MIPIDSI_TX1_D3_P	Output	Data Channel
24	MIPIDSI_TX1_D3_N	Output	Data Channel
25	GND	Ground Wire	Ground Wire
26	NC	-	-
27	LCD1_RST_L_GPIO4_C6	Input/Output	Reset Signal 3.3V
28	GND	Ground Wire	Ground Wire
29	VCC_LCD_0	Power	+3.3V Output
30	VCC_LCD_0	Power	+3.3V Output
31	VCC_LCD_0	Power	+3.3V Output

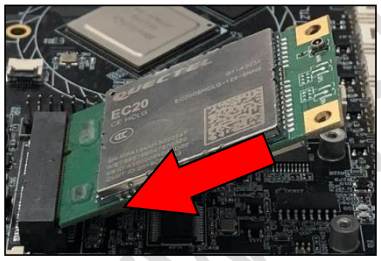
17 4G Module

52P MINI PCI-E connector, used to install 4G module (module is optional, cannot be connected to other peripherals), can realize network operations as follows:

(1) According to the module model, burn the corresponding firmware (currently supports Quectel EC20, Huawei ME909S, etc.);

(2) Insert the golden finger of the module into the base of the 4G module at an angle of 30°, and lock it with 1 or 2 metric M2*4 flat head screws; Insert the Micro-SIM card into the card slot on the back of the motherboard (the SIM card notch faces inward);

(3) Some IoT cards need to configure the APN, please consult the SIM card operator for support.





5.2 Other Standard Interfaces and Functions

Name	Spec.	Description
DC 12V Power	Female DC-5.5*2.5mm	12V Power Input
100M Ethernet interface	RJ45 interface	Supports 1-channel 10/100M Adaptive Ethernet

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Headphone	American Standard Headphone Connector	1 channel microphone mono input (analog signal input), 1 channel audio two-channel output (analog signal output);
Upgrade Key	Not self-locking key	UBOOT Key
HDMI	Female Standard HDMI	Max. 3840x2160 Output
TF Card	Standard TF card connector	Supports up to 128GB TF card expansion
SIM Card	Standard SIM card connector	Supports Mobile/China Unicom/Telecom Full Netcom
USB	Standard USB	HOST mode supports data storage, data import, USB mouse and keyboard, camera, touch screen, etc.
USB OTG	Standard USB	Supports OTG/HOST mode switching, OTG mode can be used for software debugging, upgrade, etc.
Power Key	Not self-locking key	for switch
RTC Battery Connector	Standard	Supports real-time clock, can be powered by 1220 button battery
WIFI Antenna Connector	Male IPEX	Supports WiFi 2.4GHz/5GHz dual frequency
Working Indicator	LED Light	Working state: green light; shutdown state: red light

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6. Electrical Properties

6.1 Standard Power

Item		Min.	Typ.	Max.
Standard Power Parameters	Voltage	11.4V	12V	12.6V
	Ripple	-	100mV	150mV
	Current	3A	5A	-
3.3V Output Current		-	-	200mA
USB (5V) Output Current		-	-	1A
12V Output Current		-	-	1A

*The total current of USB peripherals is recommended not to exceed 2A, and the total output current of 3.3V is recommended not to exceed 200mA, otherwise it will cause the machine to fail to operate normally. On the basis of ensuring the minimum current of 3A, 12V power supply input will increase correspondingly with the increase of the total power of peripherals.

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