# AIoT-3568CR V1.1

## Specification

Retail Mainboard

# APPROVAL SHEET

PRODEUCT: _____

PRODEUCT SPEC: _____

PRODEUCT CODE: _____

SAMPLE DATE: _____

| MADE | CHECK | APPROVED BY | PUBLISH SEAL |
|---|---|---|---|
| | | | |

CUSTOMER: _____

PART CODE: _____

CUSTOMER APPROVER: _____

| CHECKED BY | APPROVED BY | APPROVAL SEAL |
|---|---|---|
| | | |

## Document modification history

| Version | Revision content | Revision | Audit | Date |
|---|---|---|---|---|
| V1.0 | Initial version | Huangpeng | XXX | 2023-09-25 |
| V1.1 | | Huangpeng | | 2023-11-30 |
| | | | | |

# Statement



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# Catalog

# Chapter 1 Product Introduction

## 1.1 Scope of application

This product belongs to the smart cash register motherboard, which is widely used in: retail stores, dining points, gas stations, pharmacies, clothing stores, etc.

## 1.2 Product overview

This product uses Rockchip RK3568 (Cortex-A55x4) quad-core CPU, equipped with Android11 system, the main frequency is up to 2.0GHz, super performance, and rich interfaces. Whether it is benchmark or decoding, it is first-class, and it is your new choice in human-computer interaction and industrial control projects.

## 1.3 Product feature

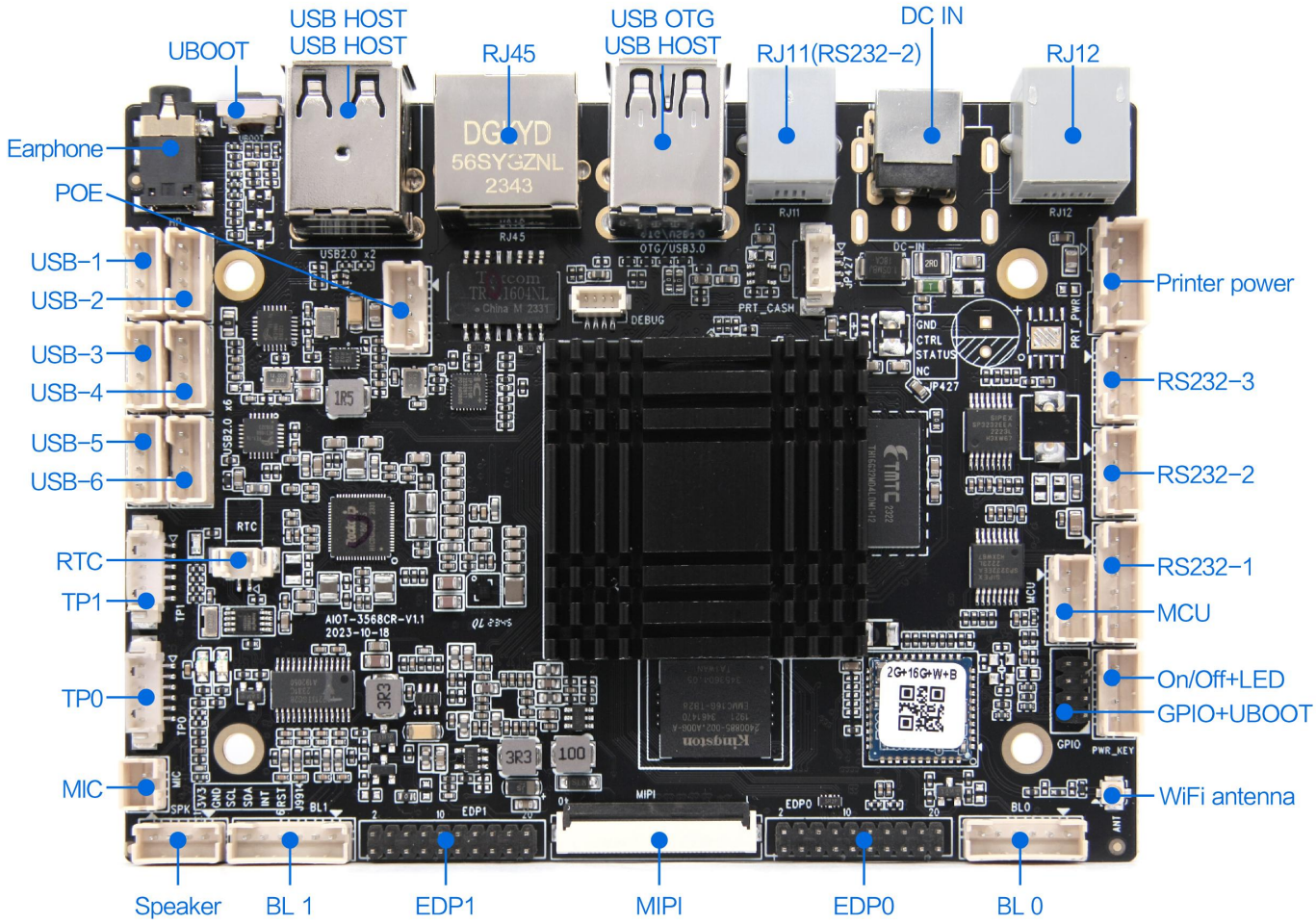
- High integration. Integrate multiple display interfaces/Ethernet /Wi-Fi/BT in one, simple and ultra-thin, outstanding.
- Rich expansion ports. 10 USB ports (six 4pin*2.0mm seats, two dual-layer USB ports), three RS232 serial ports (one full function, one RJ11), three GPIO ports, can meet the requirements of various peripherals in the market.
- Support dual-screen different display. The EDP screen supports a maximum resolution of 1920*1080, and the MIPI screen supports a maximum resolution of 1920*1080.
- High performance. Comes with a deep neural network unit (NPU) with performance up to 1 TOPS, capable of meeting the needs of deep learning projects.
- Support Android system customization, provide system call interface API reference code, and perfectly support customer upper-level application APP development.
- Supports external POE power supply with 12V/1A output.
- Rich display interface. By default, there are 2 EDP screen interfaces and 1 MiPi screen interface, and a variety of screen display combinations can be selected to meet more than 99% of the application scenarios on the market.
- Supports a wide range of USB peripherals, such as USB camera, USB flash drive, touch screen, code

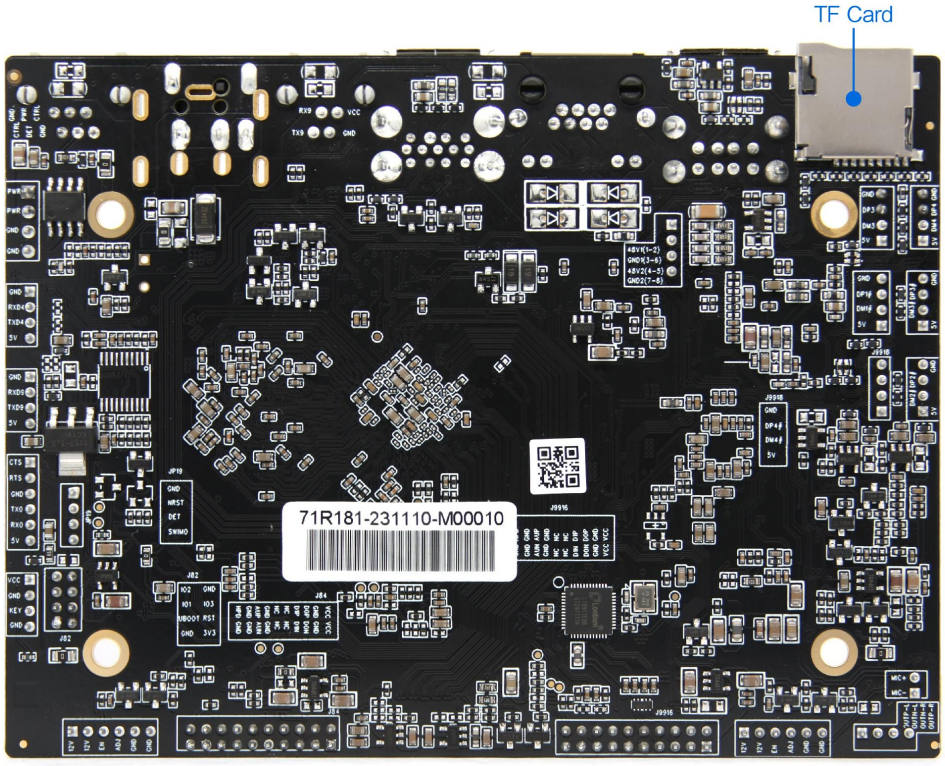
scanner, card reader, microphone, mouse, 4G module, and so on.

◆ It perfectly supports various mainstream touch screens such as infrared, optical, capacitive, resistive, touch film, etc., and supports HID configuration of drive-free touch screens without debugging.

## 1.4 Appearance and interface diagram

Front/Back:





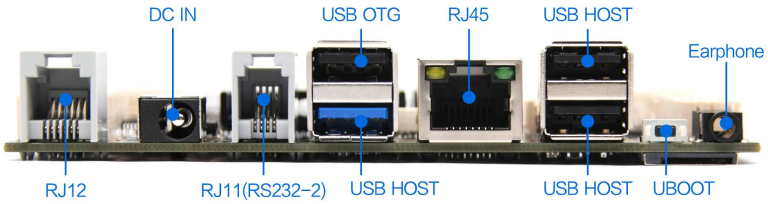

| | |
|---|---|
| FRONT VIEW |  |



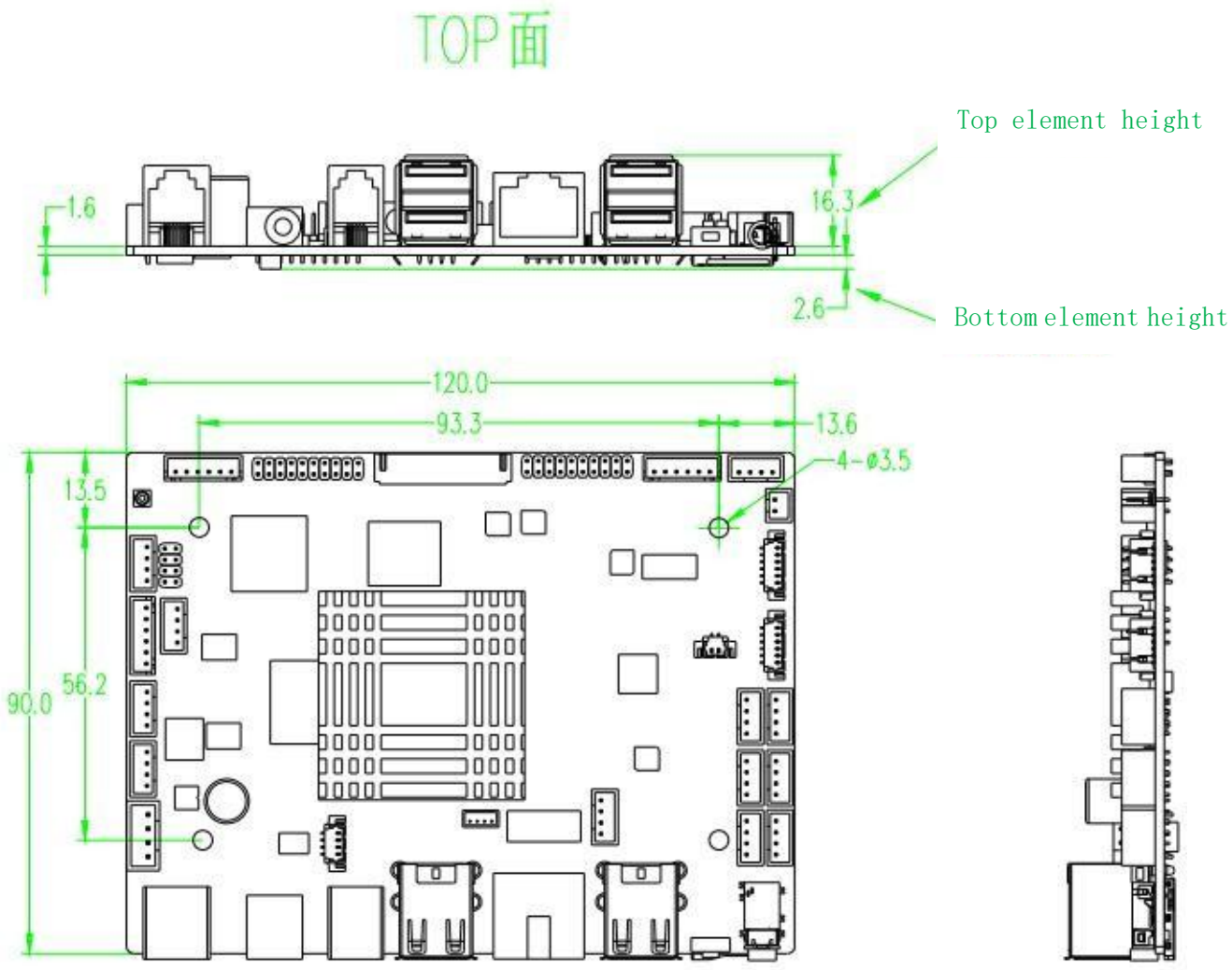
Photo statement： The above photos are taken from a certain batch of boards produced by our company. Due to the continuous maintenance of the product, the actual board cards shipped may not be consistent with the photos.

# Chapter 2 List of Basic Functions

| Main functional parameters | |
|---|---|
| Size | 120*90*1.6mm |
| CPU | RK3568A, quad-core, main frequency up to 2.0GHz |
| Operating system | Android 11.0 |
| RAM/Storage | Standard 2G (4G optional)/Standard 16G (32G/64G optional) |
| MIPI output | 1 channel, can directly drive a variety of resolutions of MIPI LCD screen, the actual test has supported 1920*1080 resolution |
| eDP output | 2 channel, can directly drive a variety of resolutions eDP interface LCD screen, EDP screen supports a maximum resolution of 1920*1080 |
| Audio input/output | Speaker output (support left and right channel output, default 6W, can be configured 10W, need to change the resistance), MIC IN*1 |
| Headphone output | Support a three/four segment headphone insertion |
| USB port | 1* USB3.0<br>9* USB HOST |
| Serial/Extension Interface | 3 channels 232(RJ11,6pin x 2.0mm, 4pin x 2.0mm socket)<br>1 channel debug serial port<br>3 GPIO ports |
| I2C port | 2 channels, which can connect to the TP screen of the I2C interface |
| Network support | 1. Support 10/100M adaptive Ethernet<br>2. Built-in Wi-Fi, support Bluetooth 4.2 |
| Storage Card | Support U disk, TF card expansion storage |
| RTC real-time clock | Support low power consumption |
| System upgrade | Supports local USB upgrade |

# Chapter 3 PCB Dimensions and Interface Layout

## 3.1 PCB size chart




PCB：6 layers of board, 1.6mm board thickness

PCBA： L * W=120mm*90mm

Specification of screw hole： ∮3.5mm x 4

Note:

1. Heat dissipation design
2. Subject to the actual size of the product

## 3.2 Interface Parameter Description

**Picture Annotation Notes: The "○" in the circle on the socket interface picture indicates the first pin. (The "○" of the red socket indicates the first pin)**

### 3.2.1 Power input interface (5.5mm*2.5 DCmm socket)

Functional description:

The board is powered by a 12V DC power supply, and it is only allowed to supply power to the board subsystem from the DC socket and power socket. Power adapter plug DC IN Specification is 5.5mm*2.5mm DC socket. When no external load is connected, the 12V DC power supply needs to support a minimum current of 300mA. The electrical definition of the power input socket is as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | 12V | power supply | 12V Input |  |
| 2 | GND | Ground wire | Ground wire | |

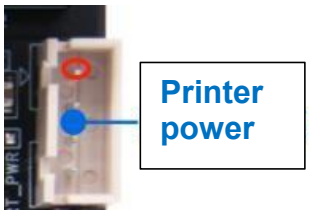
Note:
1. The specifications of the power socket must comply with the DC socket model. The default diameter of the DC socket is 6.0, the outer diameter of the copper pin is 2.4, the outer diameter of the DC plug is 5.5mm, and the aperture is 2.2 mm.
2. The voltage fluctuation range of DC socket and 6pin power input port should not exceed 10% of the standard input voltage of 12V, which may affect the stability of the motherboard operation.
3. It is recommended to use a power supply motherboard or adapter that meets the 3C standard, and the rated output power of the selected adapter can meet the motherboard and peripherals running at the same time and leave a margin of 30% -50%. That is, when the total current reaches 1.5A, the specification of 2.5A-3A should be selected.

### 3.2.2 Printer power interface (4pin/2.54mm)

Function description:

The motherboard has a 4pin/2.54mm spacing socket interface for supplying power to the printer.

Electrical definition:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | 24/12V | power supply | 24/12V output |  |
| 2 | 24/12V | power supply | 24/12V output | |
| 3 | GND | Ground wire | Ground wire | |
| 4 | GND | Ground wire | Ground wire | |

Note:

1. Pay attention to whether the positive and negative poles are correct, reverse connection may lead to short circuit, resulting in printer and motherboard damage, do not allow live plug

2. The power output voltage depends on the main board power input, 24V power input printer power output 24V,12V power input, printer power output 12V

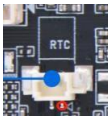
3. The 12V/24 power supply in this socket can only be used as the printer output, prohibited as a power input supply system.

### 3.2.3 RTC battery interface (2pin/1.25mm)

Functional description:

It adopts 2pin 1.25mm spacing Wafer socket interface, used to supply power to the system clock when the power is off.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | RTC | input | 3V input |  |
| 2 | GND | ground wire | ground wire | |

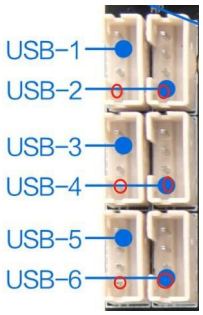
Note:
1. When using the RTC battery, check whether the positive and negative electrodes are correct. The reverse connection may cause a short circuit, which poses a risk of fire and explosion.
2. If you find that the RTC time is not accurate during use, please replace the RTC battery in time and choose the correct 3V, CR2036 button battery. If you need to use cable batteries, please contact FAE for the corresponding model specifications.

### 3.2.4 USB port (4pin/2.0mm*6)

Functional description:

The motherboard has 10 USB ports, four on the two dual-layer USB standard sockets, six on the built-in 4-pin *2.0mm spacing USB sockets, default to HOST, and supply current no greater than 1A.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | VCC | power supply | 5V Output |  |
| 2 | DM | input/output | DM | |
| 3 | DP | input/output | DP | |
| 4 | GND | Ground wire | Ground wire | |

Note:
1. Check the definition of the USB terminal cable before use to prevent the power supply from being reversed from the ground, which may burn peripherals and motherboards.
2. The length of USB peripheral cable should be as short as possible to meet the needs of use. Do not use too long a USB cable, otherwise it may cause stability problems during the use of peripherals.
3. The signal in the USB cable is a high-speed differential signal. USB wire as far as possible to use the wire with braided shielding layer, can greatly enhance the anti-interference force of the device and increase the stability of the device.

USB port description:

| Number | Screen print/serial number | Default supply current | Whether the power supply is controllable | Corresponding nodes |
|---|---|---|---|---|
| 1 | USB1 | <2A | Controllable | HUB_4 |

| | | | | |
|---|---|---|---|---|
| 2 | USB2 | 1A | Controllable | HUB_3 |
| 3 | USB3 | 1A | Controllable | HUB1_3 |
| 4 | USB4 | 1A | Controllable | HUB1_1 |
| 5 | USB5 | 1A | Controllable | HUB1_2 |
| 6 | USB6 | <2A | Controllable | HUB1_4 |
| 7 | OTG/USB3.0(double layer) | 1A | Controllable | OTG/HOST1 |
| 8 | USB2.0*2（double layer) | 1A | Controllable | HUB_1/HUB_2 |

### 3.2.5 MIC interface （2pin/2.0mm）

Functional description:

The board has a MIC port for connecting to an external microphone.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | MIC- | input | MIC- |  |
| 2 | MIC+ | input | MIC+ | |

Note:

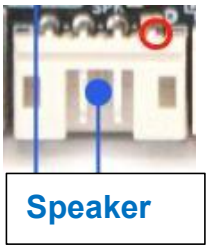
1. Pay attention to the positive and negative MIC connections, do not reverse.
2. MIC line length should not be too long, MIC line inside the device as far as possible to avoid high-speed signal line and power line layout, to avoid interference with the sound.

### 3.2.6 Speaker interface （4pin/2.0mm）

Functional description:

This port can be connected to an external speaker.

Electrical definition:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | OUTP-R | output | Audio Output Right+ |  |
| 2 | OUTN-R | output | Audio Output Right - | |
| 3 | OUTN-L | output | Audio Output Left - | |
| 4 | OUTP-L | output | Audio Output Left+ | |

Note:

1. This is a double horn connection. When a single horn is used, pin1 and pin2 are in a group, and pin3 and pin4 are in a group.
2. The use of the horn, need to connect the horn before starting, do not allow live plug and plug use.
3. The default output power of the horn interface is 6R/8W. If a 4R horn is used, the power should be reduced by half accordingly.
4. The power amplifier chip can support the maximum power to 8R/10W, requiring custom hardware implementation.

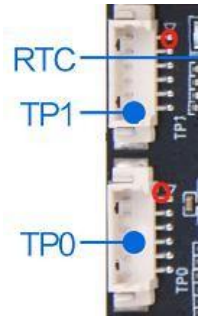
5. When using, be sure to measure the actual maximum output power should be less than the actual horn rated power.

### 3.2.7 I2C Port*2（6pin/1.25mm）

Functional description:

The board supports the TP screen connected to the I2C interface.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | 3V3 | Power supply | 3.3V Output |  |
| 2 | GND | Ground wire | Ground wire | |
| 3 | SCL | Input/Output | I2C Clock | |
| 4 | SDA | Input/Output | I2C Data | |
| 5 | INT | Input/Output | Interrupt | |
| 6 | RST | Input/Output | Reset | |



Notes：

1. The board supports the TP screen connected to the I2C interface. Before connecting the board, check whether the interface of the touch screen is I2C or USB.
2. The level of I2C, RST, and INT in the interface is 3.3V. If a 1.8V touch screen is connected, the level must be converted.
3. Please note that the electrical definition of the wire sequence matches before connecting. Connect the touch screen before powering it on. Do not plug it in when it is live.

### 3.2.8 IO/UBOOT port（2*4pin/2.0mm）

Functional description:

IO is used to provide input/output of control signals to peripherals, and the level is 3.3V. The socket also leads to the interface of the switch button and the upgrade button.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | GND | Ground wire | Ground wire | |
| 2 | VCC | power supply | 3.3V Output |  |
| 3 | ADC | Input | UBOOT | |
| 4 | RST | Input | Reset | |
| 5 | I/O | Input/Output | GPIO-1 | |

| | | | | |
|---|---|---|---|---|
| 6 | I/O | Input/Output | GPIO-3 | |
| 7 | I/O | Input/Output | GPIO-2 | |
| 8 | GND | Ground wire | Ground wire | |

Note:

1. The peripheral IO level cannot be higher than 3.3V. If the IO level of the docking device is higher than 3.3V, there should be an isolation circuit or level switching circuit, otherwise the main control and device will be burned out.

2. When using an I/O port, note whether the I/O port is an input or output port.

3. The peripheral is powered on through this IO port (When the device is powered off, the IO measured by a multimeter should be 0V).

### 3.2.9 Switch +LED (4pin/2.0mm)

Functional description:

The board reserve a switch button and a power indicator.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | LED+ | Output | 5V(3.3V optional) |  |
| 2 | GND | Ground wire | Ground wire | |
| 3 | PWRON | Input | On-off key | |
| 4 | GND | Ground wire | Ground wire | |

Note:

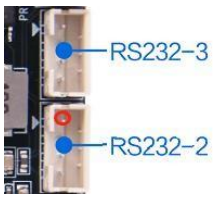
1. The indicator port is a common anode indicator port. By default, a common anode indicator is required.
2. The board default limited current, current limiting resistance is 1K, voltage 3.3V(configurable 5V), the external indicator does not need to increase the resistance, otherwise the brightness may be too low.

### 3.2.10 RS232 serial socket interface*3 (4pin/2.0mm*2+6pin/2.0mm+RJ11)

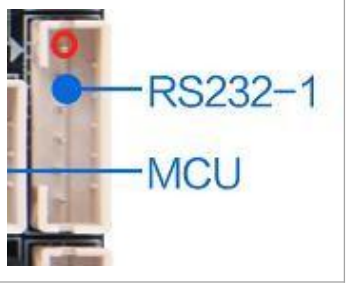
Functional description:

Two sets of ordinary RS232 serial ports and one set of fully functional serial ports are introduced, which can support common RS232 serial port devices in the market.

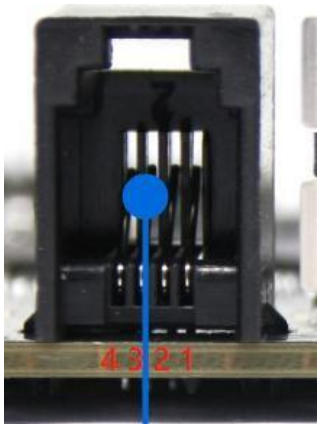
The electrical definition of 232 interface is as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | GND | Ground wire | Ground wire |  |
| 2 | RS232-RX | Input | RX | |
| 3 | RS232-TX | Output | TX | |
| 4 | VCC | Power supply | Power supply | |

The electrical definition of the 6pin/2.0mm interface is as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | CTS | Input | RXEN |  |
| 2 | RTS | Output | RTS | |
| 3 | GND | Ground wire | Ground wire | |
| 4 | RS232-TX | Output | TX | |
| 5 | RS232-RX | Input | RX | |
| 6 | VCC | Power supply | Power supply | |

The electrical definition of the RJ11 interface is as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | VCC | Power supply | 5V Output |  |
| 2 | GND | Ground wire | Ground wire | |
| 3 | RS232-RX | Input | RX | |
| 4 | RS232-TX | Output | TX | |

Precautions:

1.Whether the serial port voltage matches. Can not directly connect to TTL, RS485 serial devices.

2.Whether the connection of TX and RX is correct.

3.RJ11 serial port and RS232-2 4pin serial port is the same channel, according to the actual use of two choices.

Serial port configurations and nodes are as follows:

| No. | Serial port no. | Corresponding nodes | Default setting | Configurable or not |
|---|---|---|---|---|
| 1 | RS232-1 | TTYS0 | RS232 | RS232 |
| 2 | RS232-2(RJ11) | TTYS9 | RS232 | RS232 |

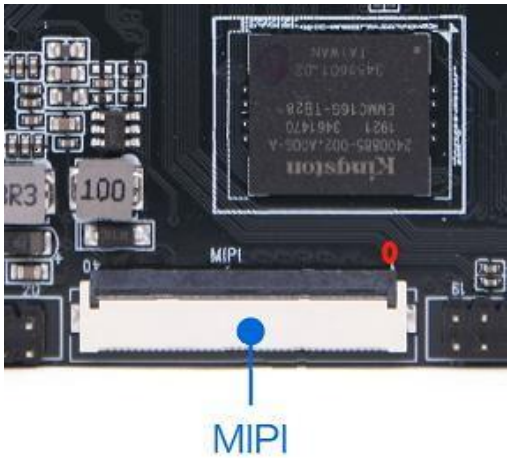
| | | | | |
|---|---|---|---|---|
| 3 | RS232-3 | TTYS4 | RS232 | RS232 |

### 3.2.11 MIPI Screen Interface (40pin/0.5mm)

Function description:

The mainboard supports one mipi screen display port in the form of a 40pin 0.5mm FPC socket.

Electrical definition:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | VDD_1V8 | Power supply | 1.8V Input | |
| 2 | VDD_3V3 | Power supply | 3.3V Input |  |
| 3 | VDD_3V3 | Power supply | | |
| 4 | NC | NC | NC | |
| 5 | Reset | Output | Screen reset signal, high level 3.3V | |
| 6 | NC | NC | NC | |
| 7 | GND | Ground wire | Ground wire | |
| 8 | MIPI_D0N | Output | MIPI Port Lane 0 negative output | |
| 9 | MIPI_D0P | Output | MIPI Port Lane 0 positive output | |
| 10 | GND | Ground wire | Ground wire | |
| 11 | MIPI_D1N | Output | MIPI Port Lane 1 negative output | |
| 12 | MIPI_D1P | Output | MIPI Port Lane 1 positive output | |
| 13 | GND | Ground wire | Ground wire | |
| 14 | MIPI_CKN | Output | MIPI Port clock negative output | |
| 15 | MIPI_CKP | Output | MIPI Port clock positive output | |
| 16 | GND | Ground wire | Ground wire | |

| | | | |
|---|---|---|---|
| 17 | MIPI_D2N | Output | MIPI Port Lane 2 negative output |
| 18 | MIPI_D2P | Output | MIPI Port Lane 2 positive output |
| 19 | GND | Ground wire | Ground wire |
| 20 | MIPI_D3N | Output | MIPI Port Lane 3 negative output |
| 21 | MIPI_D3P | Output | MIPI Port Lane 3 positive output |
| 22 | GND | Ground wire | Ground wire |
| 23 | SCL | SCL | I2C signal SCL is reserved |
| 24 | SDA | SDA | I2C signal SDA is reserved |
| 25 | GND | Ground wire | Ground wire |

1. Please confirm whether the screen power supply voltage and current and other parameters in the screen specification match the board. The default backlight drive current of the board is 70mA. If it does not match the current parameter requirements of the selected screen, you can seek support from our company's FAE, or adjust the Iled output current by adjusting the resistance value. Formula: I(led)=200mV/R.
2. Confirm that the line sequence electrical definition of the screen interface and the board interface are consistent, and the FPC screen line is selected correctly.
3. The signal level of I2C and RST in the interface is 1.8V. If the module with 3.3V level is connected, the level conversion should be done.
4. Before connection, please pay attention to whether the electrical definition of the wire sequence matches. It is necessary to connect the module before power on. Do not allow live plug.

## 3.2.12 EDP screen interface（10*2pin/2.0mm)

Functional description:

This interface is a common eDP screen interface in the form of 10*2 double-row pins. The screen voltage can be selected by the jump resistor, optionally supported V/5V screen power supply, the board default 3.3V.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | PVCC | power supply | eDP screen power output, +3.3v/+5V/ +12V optional | |
| 2 | | | | |

| | | | | |
|---|---|---|---|---|
| 3 | GND | Ground wire | Ground wire |  |
| 4 | | | | |
| 5 | D0- | Output | Display Port Lane 0 negative output | |
| 6 | D0+ | Output | Display Port Lane 0 positive output | |
| 7 | D1- | Output | Display Port Lane 1 negative output | |
| 8 | D1+ | Output | Display Port Lane 1 positive output | |
| 9 | D2- | Output | Display Port Lane 2 negative output | |
| 10 | D2+ | Output | Display Port Lane 2 positive output | |
| 11 | D3- | Output | Display Port Lane 3 negative output | |
| 12 | D3+ | Output | Display Port Lane 3 positive output | |
| 13 | GND | Ground wire | Ground wire | |
| 14 | GND | Ground wire | Ground wire | |
| 15 | AUX- | Output | Display Port AUX- chanenl negative singal | |
| 16 | AUX+ | Output | Display Port AUX+ chanenl positive singal | |
| 17 | GND | Ground wire | Ground wire | |
| 18 | GND | Ground wire | Ground wire | |
| 19 | GND | Ground wire | Ground wire | |
| 20 | eDP_HPD | Input | Screen hot plug detection signal, screen output | |



Note:

1.Please confirm whether the power supply voltage of the screen is correct in the specifications of the screen, and whether the corresponding power supply of the board can meet the maximum current of the screen.

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

3. Before connecting, check whether the electrical definition of the cable sequence matches. Connect the screen before powering on the device. Do not pull or plug the device when it is live.

## 3.2.13 Backlight control interface (6pin/2.0mm*2)

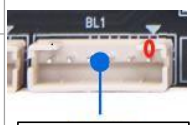
Functional description:

By default, the mainboard has two backlight adjustment/control ports, one EDP backlight adjustment/control port on the main screen and the other eDP rich screen backlight control/control port.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | VCC | Power supply | 12V Output | |

| | | | |
|---|---|---|---|
| 2 | VCC | Power supply | 12V Output |
| 3 | BL-EN | Output | Backlight enables control |
| 4 | BL-ADJ | Output | Backlight enables control |
| 5 | GND | Ground wire | Ground wire |
| 6 | GND | Ground wire | Ground wire |




Backlight 1


Backlight 0

Note:

1. The 12V power supply in this socket can only be used as backlight power output, prohibited as power input to the system.

2. The eDP backlight socket is PWM dimming by default. Please select the dimming mode according to the specifications of the selected screen.

3. ADJ and PWM can be switched by changing the hardware, please consult FAE if you need to change.

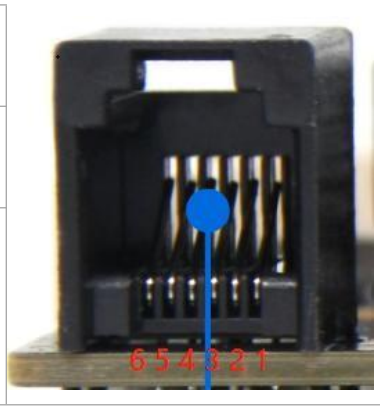
4. Due to the limited width of the motherboard power supply alignment, only the load of the motherboard itself is taken into consideration during the design, so when using a large screen over 19 inches or the power consumption of the screen is more than 15W, the backlight power supply should be taken from other power supply boards, so as not to cause system instability.

## 3.2.14 RJ12 Cash Box Interface

Function description: This interface is used for external cash box, can control the cash box open, close and detect the cash box switch status
Electrical definition:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | GND | Ground wire | Ground wire | |
| 2 | CASH | Cash Drawer Control | Cash Drawer Control | |
| 3 | DET | input | Cash box inspection (Low level cash box closed, high level cash box opened) | |

| | | | |
|---|---|---|---|
| 4 | VCC | power supply | 12V/24V |
| 5 | CASH | Cash Drawer Control | Cash Drawer Control |
| 6 | GND | Ground wire | Ground wire |

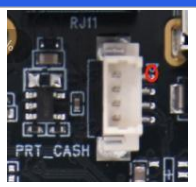



Note: 1. The power supply of the money box is determined by the power supply of the motherboard. The power supply of the motherboard is 12V, and the cash box is 12V, and the power supply of the motherboard is 24V

## 3.2.15 Printer cash box interface

Function description: The board reserves the printer cash box interface for direct connection to peripheral printer cash box interface, and the printer directly controls the cash box switch

Electrical definition:

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | GND | Ground wire | |  |
| 2 | CASH_CTRL | Ground wire | Printer controls the cash box | |
| 3 | CASH_STATUS | Input | Printer detects cash box status | |
| 4 | NC | NC | NC | |



Notes:

1. This interface is only used if the printer supports cash box control.

2. Printer money box control and 3568 motherboard money box control cannot be used at the same time to prevent conflicts.

## 3.2.16 POE Port (4pin/2.0mm)

Function Description: This interface requires an external POE module

| Number | Definition | Attributes | Description | |
|---|---|---|---|---|
| 1 | A-48V | output | POE power signal | |
| 2 | A-48V | output | POE power signal | |
| 3 | B-48V | output | POE power signal | |
| 4 | B-48V | output | POE power signal | |

Note:

By default, the POE port supports only a maximum of 15W. If the value is higher, you need to replace the network transformer.

## 3.3 Other standard interfaces and features

| Interface | Standard | Parameter Description |
|---|---|---|
| Memory interface | USB TYPE-A | USB 2.0, up to 480Mbps/s transfer rate (60MB/s)<br>USB 3.0, up to 5.0Gbps/s transfer rate (500MB/s) |
| Ethernet interface | RJ45 interface | Support 10/100/1000M wired network |
| TF Card | TF Card | Supports SD2.0 and SD3.0 |
| Cashbox interface | RJ12 | Support cash drawer and compatible with RS232/TTL serial port |
| Password keyboard, electronic scale | RJ11 | RS232 port supports access to password keyboard, electronic scale |

# Chapter 4 Electrical performance

| Items | | Min | Typical | Max |
|---|---|---|---|---|
| Power parameter | Voltage | -- | 12V | -- |
| | Ripple | -- | -- | 50mV |
| | Current | 2A | | |
| Supply current(HDMI output, no other peripherals are connected) | working current | | 250mA | 380mA |
| | standby current | | 22mA | 30mA |
| Supply current(LVDS) | 3.3V working current | | 400 mA | 1.5A |
| | 5V working current | | 550 mA | 2A |
| | 12V working current | | 580 mA | 2A |
| Supply current （eDP） | 3.3V working current | | 400 mA | 1.5A |
| | 5V working current | | 550 mA | 2A |
| | 12V working current | | 580 mA | 2A |
| Total output | current | -- | -- | 5A |
| Environment | Relative humidity | -- | -- | 80% |
| | Operating temperature | -10℃ | -- | 60℃ |
| | Storage temperature | -40℃ | | 80℃ |

Remark 1: When connecting the eDP screen, please pay attention to selecting the correct screen working voltage 3.3V, 5V, 12V to avoid burning the screen.

Remark 2: When connecting to eDP screen, the overall working current and standby current of the board depend on the connected screen, which are not listed in the above table.

Remark 3: When connecting to a 12V printer, the maximum peak current of the adapter is required to support 13A, (the peak current is 13A) the adapter is at least 12V 7.5A

# Chapter 5 Minimum test item of the whole machine

Description:

| Minimum test item of stability and reliability of the whole machine | | |
|---|---|---|
| **Number** | **Test item** | **Test detail and description** |
| 1 | Basic functional performance test | Test the main function performance of the whole machine, test wifi, Bluetooth, Ethernet, USB, serial port, video playback and other functions |
| 2 | Software upgrade function test | The whole product upgrade function verification, respectively test product line brush, U disk upgrade, and network remote upgrade function is normal |
| 3 | High temperature aging test | Test the high temperature resistance of the whole machine. After playing the aging work video in 60℃ environment for 3 days, it can run normally and there are no bad electrical phenomena such as crash, abnormal painting and black screen |
| 4 | Low temperature power failure test | Test the anti-low temperature ability of the whole machine. After playing the aging work video in 0℃ environment for 3 days, it can run normally and there are no bad electrical phenomena such as crash, abnormal painting and black screen |
| 5 | Short time timing switch at normal temperature | Test the product in the ability to withstand power on and off, programming 3 minutes to shut down, 7 minutes to start, after 7 days of normal operation, no crash, abnormal, black screen and other electrical adverse phenomena, abnormal record probability is not more than 4/10000 |
| 6 | Electrostatic (ESD) test | The simulation test evaluates the anti-static discharge capability of the product. According to the IEC 61000-4-2 test standard, the product is discharged by contact ±4KV and air ±8KV. Product validation must meet A Grade A or B to be accepted, and C and D grades are nonconformity |
| 6 | Low temperature power failure test | Test the product in the ability to withstand power on and off, programming 3 minutes to shut down, 7 minutes to start, after 7 days of normal operation, no crash, abnormal, black screen and other electrical adverse phenomena, abnormal record probability is not more than 4/10000 |
| 7 | Sweep vibration test | Test the vibration resistance of the product through simulated transport tests and the bearing capacity of the board solder and parts to avoid potential problem points. The vibration tester was used to test the product. After the test, the structure of the test product was not loose and fell off, and it could operate normally. There was no crash, abnormal painting, black screen and |

| | | |
|---|---|---|
| | | other electrical defects and structural appearance damage, and it was judged to be OK |
| 8 | Free drop test | Simulation of the drop capacity of the transported product is used to determine the bearing capacity of the machine mechanism to avoid potential problems for design and process improvement. After the test is completed, the test product can run normally, no crash, abnormal display, black screen and other bad electrical and structural appearance damage phenomenon is determined as OK |
| 9 | Short power failure shock at normal temperature | Through this test, the ability of the product to withstand the power supply is tested |
| 10 | Long time timing switch machine at normal temperature | To verify the stability of MCU and the stability of system operation, the timing switch tool is set to start the machine at 9:30 am and shut down at 18:30 minutes, and the log records the same time interval for each startup. Turn on and off on time. If the error is less than 1min, it is judged to be qualified |
| 11 | Voltage overvoltage and undervoltage test | According to the power supply specification of the Android board, the voltage bearing capacity of the board is tested through the voltage change, and the whole machine is tested for 2 hours under the rated power supply of -20% +30%. After the test is carried out and completed, the test product can run normally, and no bad electrical phenomena such as crash, abnormal painting and black screen are judged to be OK |

# Chapter 6 Configurable parameter table (difference point)

| Type | Standard | | Full function | | High configuration | |
|---|---|---|---|---|---|---|
| DDR | 2G | ☑ | 2G | ☑ | 2G | ☐ |
| | 4G | ☐ | 4G | ☐ | 4G | ☑ |
| | 8G | ☐ | 8G | ☐ | 8G | ☐ |
| EMMC | 16 | ☑ | 16 | ☑ | 16 | ☐ |
| | 32 | ☐ | 32 | ☐ | 32 | ☑ |
| | 64 | ☐ | 64 | ☐ | 64 | ☐ |
| Wi-Fi+BT | 2.4G+BT | ☑ | 2.4G+BT | ☐ | 2.4G+BT | ☐ |
| | 5G+BT | ☐ | 5G+BT | ☑ | 5G+BT | ☑ |
| 4G/PCIE | ☐ | | ☐ | | ☐ | |
| 5G/M.2 | ☐ | | ☐ | | ☐ | |
| ETH/RJ45 | ☑ | | ☑ | | ☑ | |
| SATA3.0 | ☐ | | ☐ | | ☐ | |
| LVDS | ☐ | | ☐ | | ☐ | |
| eDP | ☑ | | ☑ | | ☑ | |
| MIPI | ☑ | | ☑ | | ☑ | |
| HDMI | ☐ | | ☐ | | ☐ | |
| USB*10 | ☑ | | ☑ | | ☑ | |
| TTL*2 | ☐ | | ☐ | | ☐ | |
| RS232*3 | ☑ | | ☑ | | ☑ | |
| RS485*1 | ☐ | | ☐ | | ☐ | |
| CAN*1 | ☐ | | ☐ | | ☐ | |
| Hdmi in | ☐ | | ☐ | | ☐ | |
| TF | ☑ | | ☑ | | ☑ | |

# Chapter 7 Assembly and Use Precautions

**In the process of assembly and use, please pay attention to the following (and not limited to) problems.**

1. Please ensure that the board card is not electrified for installation and installation of peripherals, and be sure to wear electrostatic bracelet and other anti-static tools during installation.

2. When connecting peripherals through wires, please ensure that the pin definition of each peripheral is corresponding to the socket of the main board to avoid short circuit caused by wire sequence error.

3. When fixing the main board with screws, pay attention to make the board card bear the force evenly, so as to avoid the PCB opening due to the deformation of the board car.

4. When installing interfaces with optional screen voltages (such as LVDS, eDP, etc.), please note that the voltage selected is consistent with the screen specifications.

5. When installing peripherals (USB, UART, IO .etc), pay attention to the level matching and current output capability of peripherals.

6. The 12V power supply in the backlight socket can only be used as backlight power output, and is strictly prohibited to be used as power input to the motherboard.The input power should be selected according to the general peripherals to evaluate whether the input power voltage and total current can meet the requirements.

7. The input power should be selected according to the general peripherals to evaluate whether the input power voltage and total current can meet the requirements.

8. When designing the whole product, the height limit and heat dissipation of the board should be considered.