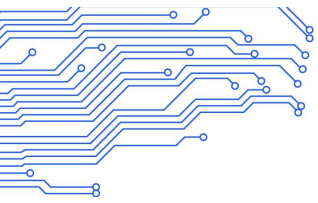
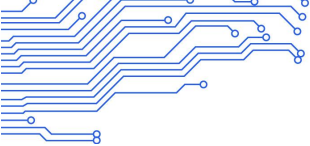


AIoT-3568HV V1.1

Specification

Commercial Display 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 | Xie Zhiwen | | 2023-04-21 |
| V1.1 | Revision | Huang Peng | | 2023-04-25 |
| | | | | |
| | | | | |

Statement

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Chapter 1 Product Introduction

1.1 Scope of application

Alot-3568HV belongs to the motherboard of commercial display self-service terminal, which is generally applicable to smart display terminal products, video terminal products, and industrial automation terminal products, such as: advertising machines, digital signage, smart self-service terminals, smart retail terminals, O2O smart devices, industrial control host, robot equipment, etc.

1.2 Product overview

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

1.3 Product feature

- ◆ High integration. Integrate multiple display interfaces/Ethernet /Wi-Fi/BT in one, simple and ultra-thin, outstanding.
- ◆ Built-in PCI-E 4G module interface. Supports multiple PCI-E 4G modules such as Quectel and Longshang to access the Internet.
- ◆ Rich expansion interface. 6 USB ports (4 pins, 2 standard USB ports), 3 serial ports (1 channel TTL, 1 channel RS232, 1 channel RS485), GPIO/ADC interface, which can meet the requirements of various peripherals on the market.
- ◆ Support dual-screen different display. LVDS screen supports a maximum resolution of 1920*1200, MIPI-LCD screen can support 1920*1080 resolution, V-by-one screen maximum support 4096×2160.
- ◆ HDMI-IN input is supported. The maximum resolution is 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.
- ◆ Rich display interface, in addition to LVDS and MIPI display interface, but also support HDMI 2.0 display

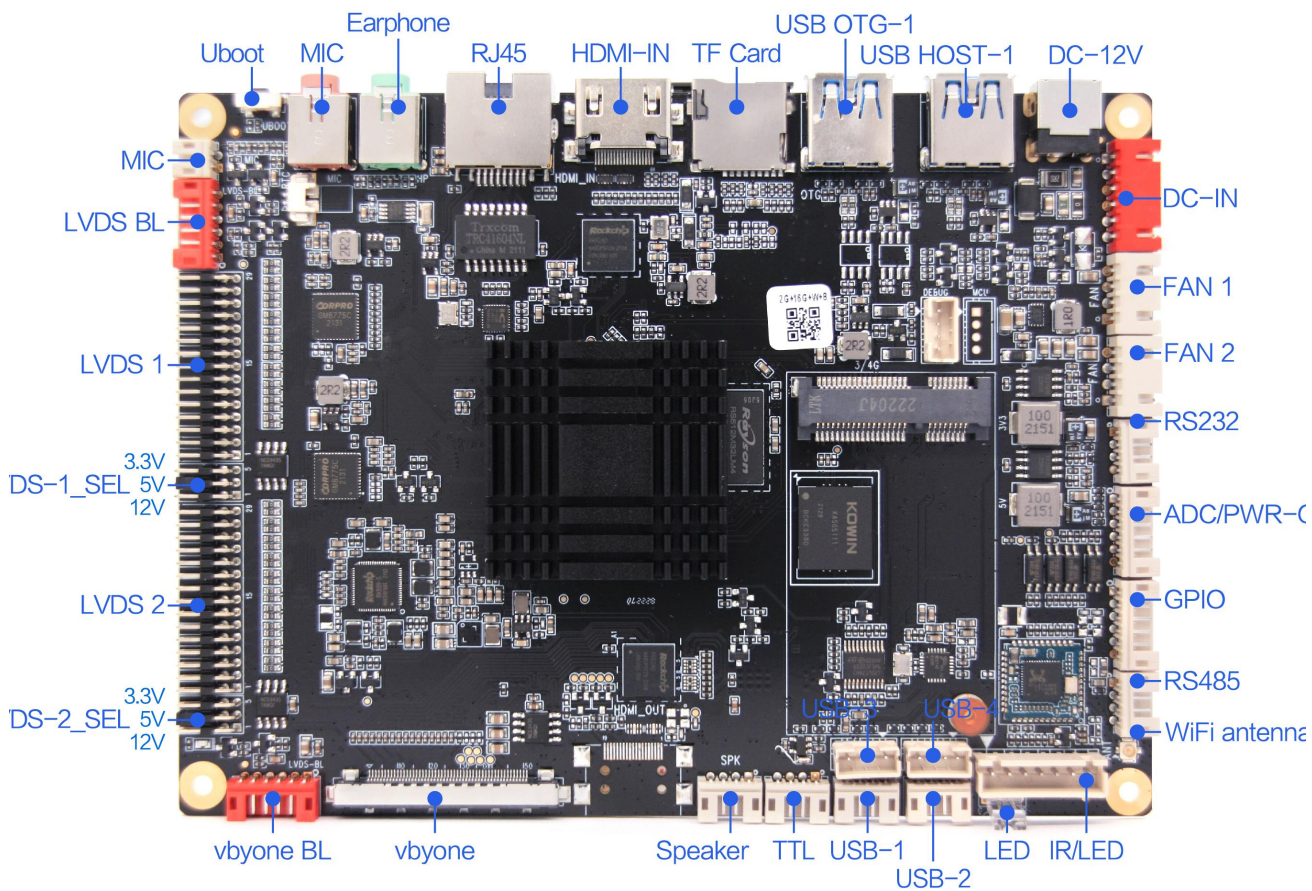


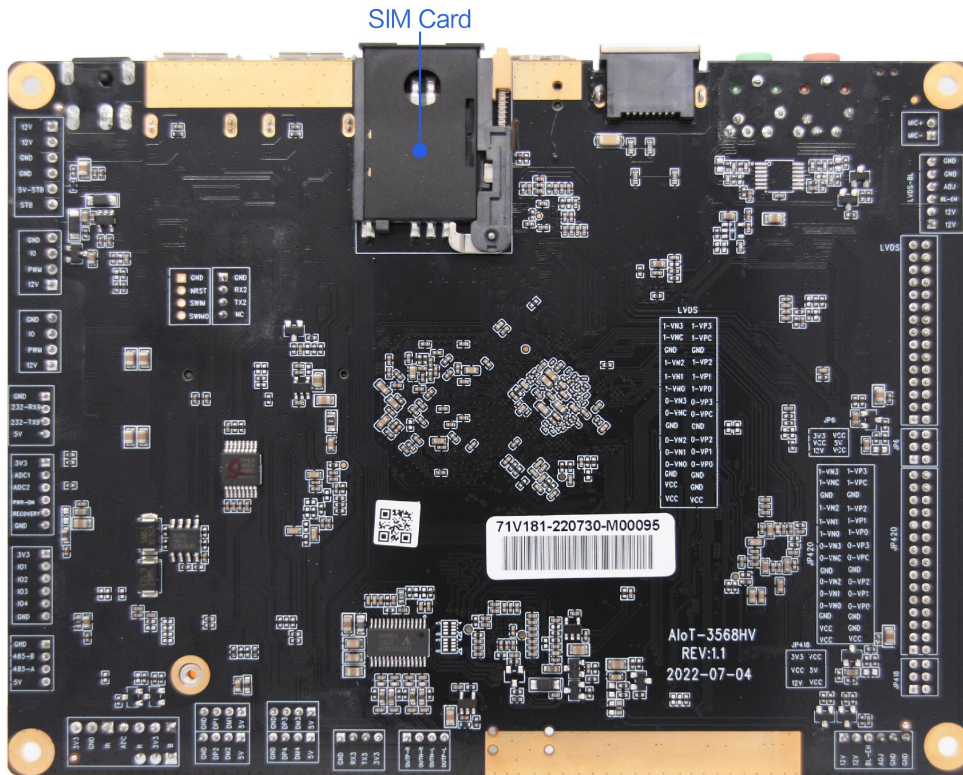
output, bandwidth up to 18Gbps, the highest can support 4K@60Hz, the interface TYPE is HDMI Type-A(HDMI or V-by-one), to meet the market more than 99% of the application scenarios.

- ◆ 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.
- ◆ Support USB single-binocular camera.
- ◆ 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

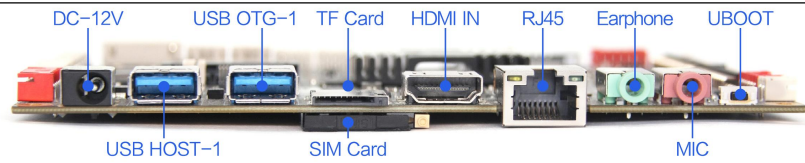


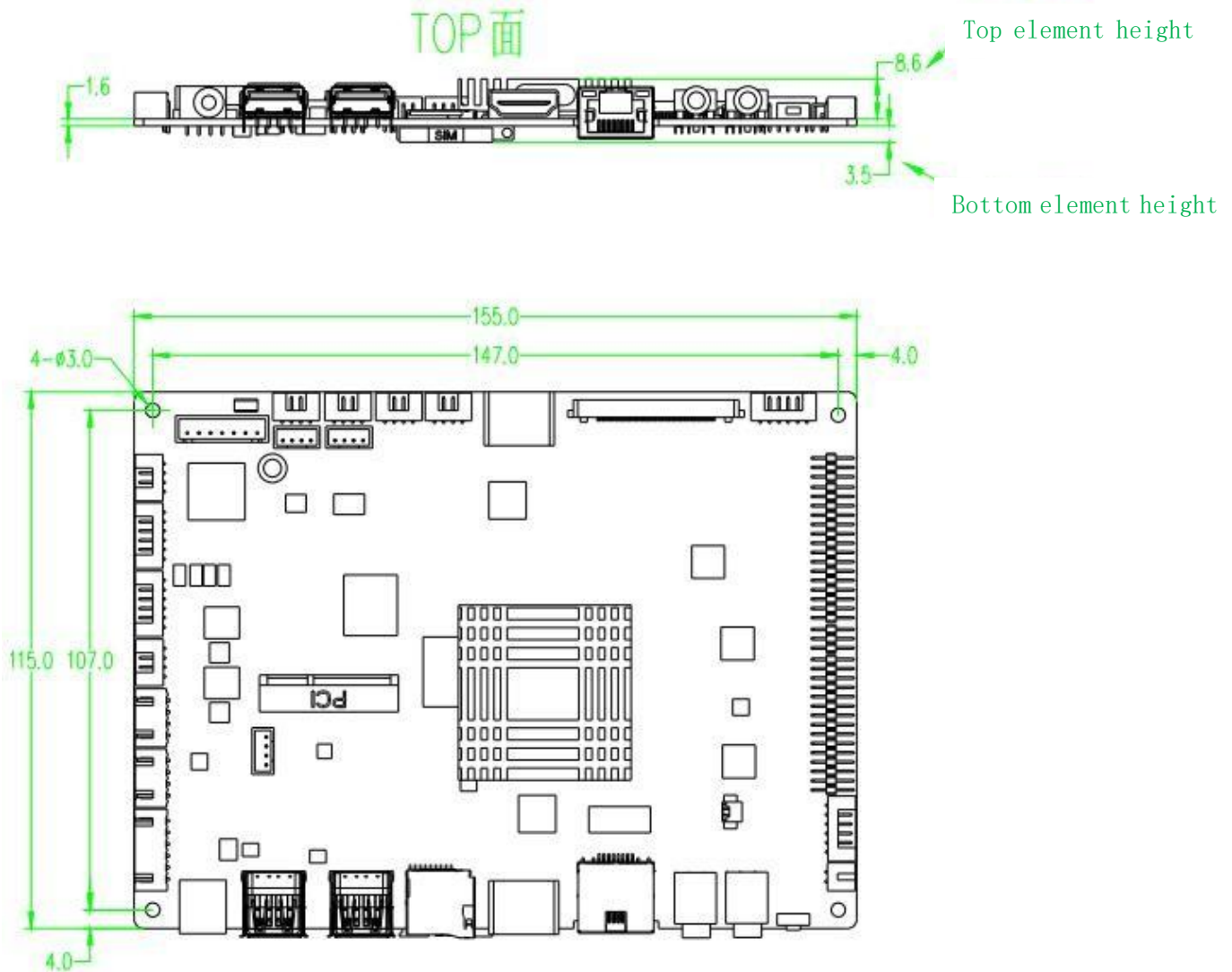
Photo statement: The above photos are taken from a certain batch of boards produced by our company. Due to the continuous maintenance of the product, the actual board cards shipped may not be consistent with the photos.

Chapter 2 List of Basic Functions

| Main functional parameters | |
|----------------------------|--|
| Size | 155*115mm |
| CPU | RK3568, quad core, highest frequency: 2.0GHz |
| Operating system | Android 11.0 |
| RAM/Storage | Standard 2G(4GB optional)/ Standard 16G(32GB/64GB optional) |
| Built-in ROM | 2KB EEPROM (without by default, optional) |
| HDMI output | 1, standard Type-A female socket, up to 4Kx2K@60Hz resolution (Optional) |
| HDMI Input | 1, standard Type-A female socket, up to support 1080P@60Hz resolution |
| LVDS output | 2, support single/dual 6-8 bit, can directly drive 50/60Hz LCD screen, LVDS screen supports a maximum resolution of 1920*1080. |
| V-by-one output | 1, standard V-by-one female socket, up to support 4k@60Hz resolution |
| Audio input/output | Speaker output (Support left and right channel output. The default is 6W. Can be configured with 10W, need to change the resistor) 、 MIC IN*1 |
| Headphone output | Support one-way three segment headphone insertion |
| USB port | 2 USB3.0 OTG 4 USB HOST |
| Serial port | 1*232 1*TTL 1*RS485 |
| Network support | 1. Support 10/1000M adaptive Ethernet 2. Built-in WiFi, support Bluetooth 4.2 3. Built-in MINI PCI-E interface, can support 4G Internet access, do not support analog or digital calls |
| Storage | Support U disk, TF card expansion storage |
| RTC real-time clock | Support low power consumption |
| System upgrade | Support local USB upgrade |

Chapter 3 PCB Dimensions and Interface Layout

3.1 PCB size chart



PCB: 1.6mm board thickness


PCBA: L * W=155mm*115mm

Specification of screw hole: ϕ 3.2mm 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 (6pin/2.54mm)

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. The DC IN specifications of the power adapter plug are D6.0, d2.0. When no external load is connected, the 12V DC power supply needs to support a minimum current of 600mA. The electrical definition of the power input socket is as follows:

| Number | Definition | Attributes | Description |
|--------|------------|-------------|-----------------------|
| 1 | 12V | Input | 12V Input |
| 2 | 12V | Input | 12V Input |
| 3 | GND | Ground wire | Ground wire |
| 4 | GND | Ground wire | Ground wire |
| 5 | 5V-STB | Input | Standby 5V input |
| 6 | STB | Output | Standby signal output |



Note:

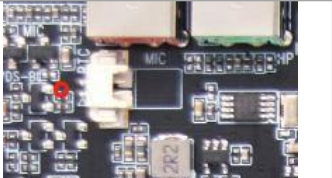
1. The specifications of the power socket must comply with the DC socket model. The default diameter of the DC socket is 6.0, the outer diameter of the copper pin is 2.0, the outer diameter of the DC plug is 5.5mm, and the aperture is 2.1 mm.
2. The voltage fluctuation range of DC socket and 6pin power 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 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:

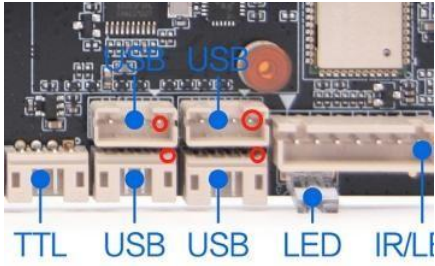
1. When using the RTC battery, check whether the positive and negative electrodes are correct. The reverse connection may cause a short circuit, which poses a risk of fire and explosion.
2. If you find that the RTC time is not accurate during use, please replace the RTC battery in time and choose the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

3.2.3 USB port (4pin/2.0mm*4)

Functional description:

The motherboard has 2 standard USB interfaces and 4 built-in USB sockets for peripheral expansion. The default is HOST and the power supply current is 1A.

Electrical definitions are as follows:

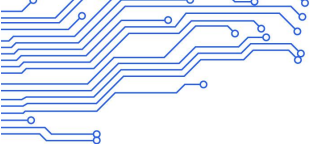
| Number | Definition | Attributes | | Description |
|--------|------------|--------------|-------------|--|
| 1 | VCC | power supply | 5V Output |  |
| 2 | DM | input/output | DM | |
| 3 | DP | input/output | DP | |
| 4 | GND | Ground wire | Ground wire | |

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 | USB OTG-1 | 1A | Controllable | OTG |
| 2 | USB HOST-2 | 1A | Controllable | HOST-2 |
| 3 | USB-1 | Unlimited/share 3A | Uncontrollable | HUB-1 |
| 4 | USB-2 | 1A | Controllable | HUB-2 |
| 5 | USB-3 | Unlimited/share 3A | Uncontrollable | HUB-3 |
| 6 | USB-4 | 1A | Controllable | HUB-4 |

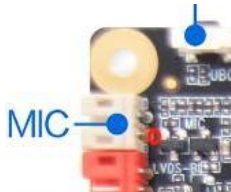


3.2.4 MIC interface (2pin/2.0mm)

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.

3.2.5 Work Indicator

Function description: The main board default with a common anode red and blue double LED lights.

Electrical definitions are as follows:


| Number | Definition | Attributes | Description | |
|--------|------------|--------------|-------------------------|---|
| 1 | LED_B | blue light | Work indicator light |  |
| 2 | VCC | power supply | 3.3V Output | |
| 3 | LED_R | red light | Standby indicator light | |

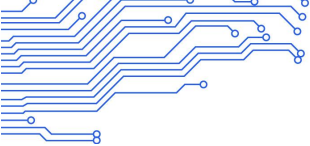
3.2.6 LED/IR port (7pin/2.54mm)

Functional description:

The motherboard's LED/IR interface can be combined into a single 7-pin socket that functions as a single LED/IR. The location is shared with the remote control receiver and indicator (optional welded 2.54mm spacing 7pin socket).

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|--------|------------|--------------|----------------------|---|
| 1 | LED_B | Output | Work indicator light |  |
| 2 | VCC | power supply | 3.3V Output | |



| | | | |
|---|-------|--------------|-----------------------------|
| 3 | LED_R | Output | Standby indicator light |
| 4 | ADC | ADC input | ADC signal input |
| 5 | IR | input | Remote control signal input |
| 6 | GND | Ground wire | Ground wire |
| 7 | 3.3V | power supply | 3.3V Output |

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, LED light drive current 6mA, voltage 3.3V, the external indicator does not need to increase resistance, otherwise the brightness may be too low.

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

Functional description:

By default, the board has two backlight adjustment/control ports. One is the LVDS backlight adjustment/control port by default, and the other is the V-by-one backlight control/control port by default.

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 enable control |
| 4 | BL-ADJ | Output | Backlight brightness control |
| 5 | GND | Ground wire | Ground wire |
| 6 | GND | Ground wire | Ground wire |



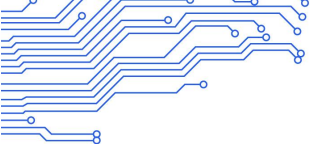
Note:

1. The 12V power supply in this socket can only be used as backlight power output, prohibited as power input to the system.
2. LVDS/V-by-one dimming mode is ADJ by default, please choose the dimming mode according to the specification 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.

3.2.8 IO/KEY port (8pin/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 | VCC | power supply | 3.3V Output |
| 2 | I/O | Input | GPIO-1 |
| 3 | I/O | Input | GPIO-2 |
| 4 | I/O | Output | GPIO-3 |
| 5 | I/O | Input | GPIO-4 |
| 6 | 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 KEY port (8pin/2.0mm)

| Number | Definition | Attributes | Description |
|--------|------------|--------------|-------------------------|
| 1 | VCC | power supply | 3.3V Output |
| 2 | ADC1 | Input | GPIO-1 |
| 3 | ADC2 | Input | GPIO-2 |
| 4 | PWRON | Input | External power button |
| 5 | Uboot | Input | External upgrade button |
| 6 | GND | Ground wire | Ground wire |



Note:

1. ADC pin is 1.8V IO, default plus pull, no need to add external pull resistance

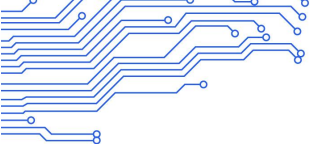
3.2.10 LVDS screen interface (15*2pin/2.0mm)

Functional description:

Generic LVDS interface definition, support single/dual, 6/8-bit 1080P LVDS screen.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description |
|--------|------------|--------------|--|
| 1 | PVCC | power output | LCD power output, +3.3v/+5V/ +12V optional |
| 2 | | | |
| 3 | | | |

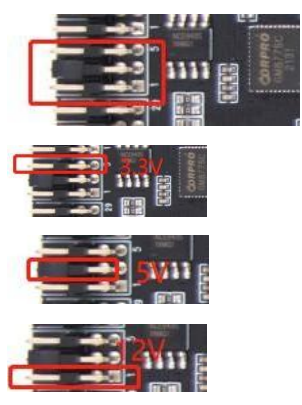


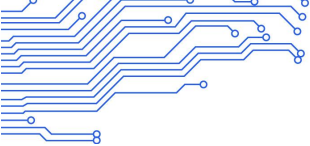
| | | | |
|----|-------|-------------|--------------------------------|
| 4 | GND | Ground wire | Ground wire |
| 5 | | | |
| 6 | | | |
| 7 | 0-VN0 | Output | Pixel0 Negative Data (Odd) |
| 8 | 0-VP0 | Output | Pixel0 Positive Data (Odd) |
| 9 | 0-VN1 | Output | Pixel1 Negative Data (Odd) |
| 10 | 0-VP1 | Output | Pixel1 Positive Data (Odd) |
| 11 | 0-VN2 | Output | Pixel2 Negative Data (Odd) |
| 12 | 0-VP2 | Output | Pixel2 Positive Data (Odd) |
| 13 | GND | Ground wire | Ground wire |
| 14 | GND | Ground wire | Ground wire |
| 15 | 0-VNC | Output | Negative Sampling Clock (Odd) |
| 16 | 0-VPC | Output | Positive Sampling Clock (Odd) |
| 17 | 0-VN3 | Output | Pixel3 Negative Data (Odd) |
| 18 | 0-VP3 | Output | Pixel3 Positive Data (Odd) |
| 19 | 1-VN0 | Output | Pixel0 Negative Data (Even) |
| 20 | 1-VP0 | Output | Pixel0 Positive Data (Even) |
| 21 | 1-VN1 | Output | Pixel1 Negative Data (Even) |
| 22 | 1-VP1 | Output | Pixel1 Positive Data (Even) |
| 23 | 1-VN2 | Output | Pixel2 Negative Data (Even) |
| 24 | 1-VP2 | Output | Pixel2 Positive Data (Even) |
| 25 | GND | Ground wire | Ground wire |
| 26 | GND | Ground wire | Ground wire |
| 27 | 1-VNC | Output | Negative Sampling Clock (Even) |
| 28 | 1-VPC | Output | Positive Sampling Clock (Even) |
| 29 | 1-VN3 | Output | Pixel3 Negative Data (Even) |
| 30 | 1-VP3 | Output | Pixel3 Positive Data (Even) |



The screen power supply voltage can be adjusted through the LVDS-SEL socket and selected through the jumper cap, optionally supporting 3.3V/5V/ 12V panel power supply. Electrical definitions are as follows:

| Number | Definition | Attributes | Description |
|--------|-------------|--------------|---|
| 1 | 12V | power supply | 12V screen power jumps this pin to PANELVCC_IN |
| 2 | PANELVCC_IN | power supply | Screen power input pin |
| 3 | PANELVCC_IN | power supply | Screen power input pin |
| 4 | 5V | power supply | 5V screen power jumps this pin to PANELVCC_IN |
| 5 | 3.3V | power supply | 3.3V screen power jumps this pin to PANELVCC_IN |





| | | | |
|---|-------------|--------------|------------------------|
| 6 | PANELVCC_IN | power supply | Screen power input pin |
|---|-------------|--------------|------------------------|

In order to avoid burning the board and screen, please pay attention to the following:

1. Please confirm whether the power supply voltage of the screen is correct in the screen specification 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. When receiving a single screen line of a 6/8-bit LVDS screen, plug it in and install it close to the pin1 end. Do not reverse and dislocation, so as to avoid damage to the screen and motherboard.
4. Before connecting, check whether the electrical definition of the cable sequence matches. Connect the screen before powering on the device. Do not plug or plug the device when it is live.

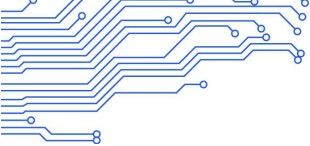
3.2.11 V-by-one Screen Interface (51pin/0.5mm)

Function description:

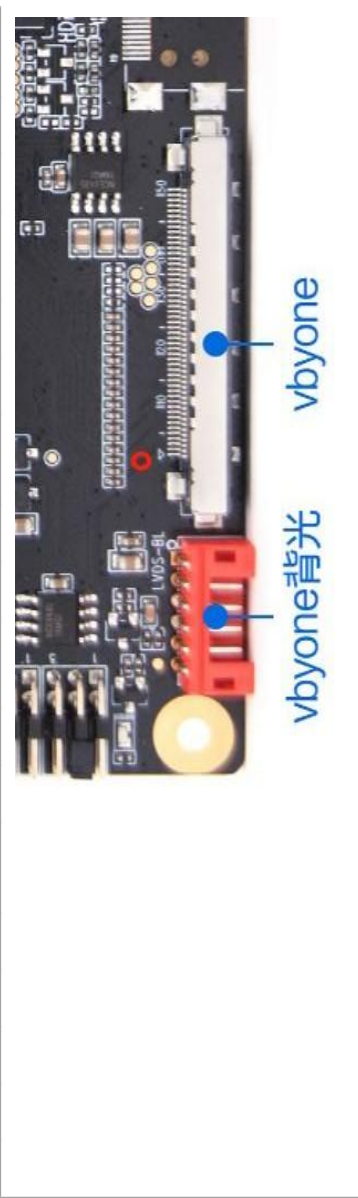
This interface is a common V-by-one screen interface. The interface is 51pin standard V-by-one screen interface definition Electrical definition:

| Number | Definition | Attributes | Description |
|--------|------------|------------|---|
| 1 | GND | | ground wire |
| 2 | RX7P | | Pixel Negative V-by-One differential data |
| 3 | RX7N | | Pixel Negative V-by-One differential data |
| 4 | GND | | ground wire |
| 5 | RX6P | | Pixel Negative V-by-One differential data |
| 6 | RX6N | | Pixel Negative V-by-One differential data |
| 7 | GND | | |
| 8 | RX5P | | Pixel Negative V-by-One differential data |
| 9 | RX5N | | Pixel Negative V-by-One differential data |
| 10 | GND | | ground wire |
| 11 | RX4P | | Pixel Negative V-by-One differential data |
| 12 | RX4N | | Pixel Negative V-by-One differential data |





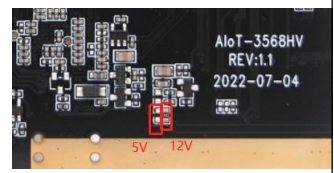
| | | | |
|----|-------|--|---|
| 13 | GND | | ground wire |
| 14 | RX3P | | Pixel Negative V-by-One differential data |
| 15 | RX3N | | Pixel Negative V-by-One differential data |
| 16 | GND | | ground wire |
| 17 | RX2P | | Pixel Negative V-by-One differential data |
| 18 | RX2N | | Pixel Negative V-by-One differential data |
| 19 | GND | | ground wire |
| 20 | RX1P | | Pixel Negative V-by-One differential data |
| 21 | RX1N | | Pixel Negative V-by-One differential data |
| 22 | GND | | ground wire |
| 23 | RX0P | | Pixel Negative V-by-One differential data |
| 24 | RX0N | | Pixel Negative V-by-One differential data |
| 25 | GND | | ground wire |
| 26 | LOCKN | | Lock detect output |
| 27 | HTPDN | | Hot plug detect output |
| 28 | NC | | NC |
| 29 | NC | | NC |
| 30 | NC | | NC |



Electrical definitions are as follows:

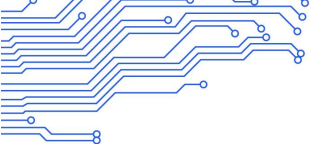
The default screen voltage is 12V screen power supply. You can select 5V power supply by using the resistor reserved on the board. Specifically, the left resistor is pasted with 5V and the right resistor is pasted with 12V

| Number | Definition | Attributes | Description |
|--------|------------|--------------|--|
| 1 | 12 | power supply | 12V screen power supply Jump this pin to PANELVCC_IN |
| 2 | 5V | power supply | 5V screen power supply Jump this pin to PANELVCC_IN |



Note:

1. Please confirm whether the power supply voltage of the screen specification book is correct and whether the corresponding power supply of the board can meet the maximum working current of the screen.
2. Use a multimeter to check whether the power supply for the jumper cap is correct.




3. Before connecting, please pay attention to whether the electrical definition of the line sequence matches. Connect the screen first and then power on.

3.2.12 RS232 serial socket interface (4pin/2.54mm)

Functional description:

The board has 1 sets of common 232 serial ports by default, which can support common 232 serial devices on the market.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|--------|------------|--------------|-------------|---|
| 1 | GND | Ground wire | Ground wire |  |
| 2 | PC232-RX | Input | 232-RX | |
| 3 | PC232-TX | Output | 232-TX | |
| 4 | VCC | Power supply | 5V Output | |

Precautions:

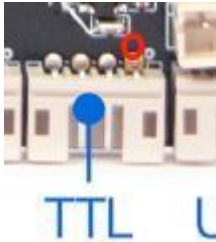
1. Whether the serial port voltage matches. Can not directly connect to TTL, RS485 serial devices.
2. Whether the connection of TX and RX is correct.

3.2.13 TTL serial socket interface (4pin/2.0mm)

Functional description:

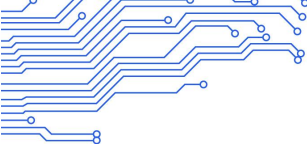
The board supports 1 sets of common dual-wire serial ports, which can support common serial port devices in the market, and the level of serial ports is 0V to 3.3V.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description | |
|--------|------------|--------------|-------------|---|
| 1 | GND | Ground wire | Ground wire |  |
| 2 | UART-RX | Input | RX | |
| 3 | UART-TX | Output | TX | |
| 4 | VCC | Power supply | 3.3V Output | |

Precautions:

1. Whether the TTL serial port voltage matches. Can not directly connect to RS232, RS485 equipment.
2. Whether the connection of TX and RX is correct.
3. If the level of the connected serial port is higher than 3.3V, there must be an isolation circuit or a level conversion circuit, otherwise the main control and equipment will be burned out.



4. Note the mapping between system nodes and hardware serial ports during software development. For details, see Definition of Serial Ports and System Nodes in the following section.


3.2.14 485 Serial port socket (4pin/2.0mm)

Function description:

The board also leads to a set of ordinary 485 serial ports, which can support 485 serial port devices on the market.

Electrical definitions are as follows:

| Number | Definition | Attributes | Description |
|--------|------------|--------------|-------------|
| 1 | GND | Ground wire | Ground wire |
| 2 | 485-B7 | Input/output | 485-B7 |
| 3 | 485-A7 | Input/output | 485-A7 |
| 4 | VCC | Power supply | 5VOutput |



Note:

1. Whether the serial port type matches, can not directly access RS232,TTL serial port devices.
2. Whether A and B are connected correctly.

Serial port configurations and nodes are as follows:

| Number | Serial Number | Corresponding nodes | Default setting | Configurable or not |
|--------|---------------|---------------------|-----------------|---------------------|
| 1 | TTL port-1 | TTYS3 | TTL | not |
| 3 | RS485-1 | TTYS7 | RS485 | RS485 > TTL |
| 4 | RS232-1 | TTYS9 | RS232 | RS232 > TTL |

Note:

1. Professionals are required to modify the configuration

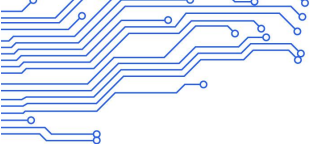
3.2.15 Fan interface (4pin*2/2.0mm)

Function description:

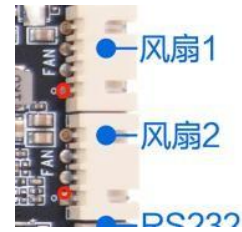
The board has two sets of fan interfaces, and the wind speed is adjustable.

Electrical definition:

| Number | Definition | Attributes | Description |
|--------|------------|--------------|---------------|
| 1 | VCC | power supply | 12V output |
| 2 | PWM | output | PWM debugging |
| 3 | IO | input | signal input |



| | | | |
|---|-----|-------------|-------------|
| 4 | GND | ground wire | ground wire |
|---|-----|-------------|-------------|



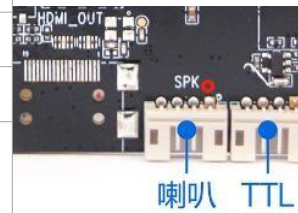
Note:

1. The output power supply is 12V output.
2. Before connecting, check whether the electrical definition of the cable sequence matches. Connect the fan before powering it on.

3.2.16 Speaker port (4pin/2.0mm)

Functional description: This port can be connected to an external speaker.

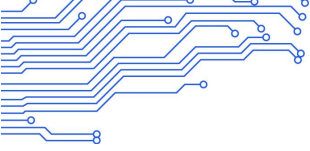
| Number | Definition | Attributes | Description |
|--------|------------|------------|----------------------|
| 4 | OUTP-L | output | Audio output left + |
| 3 | OUTN-L | output | Audio output left - |
| 2 | OUTN-R | output | Audio output right - |
| 1 | OUTP-R | output | Audio output right + |



Note:

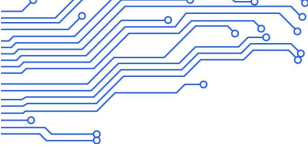
1. This is a dual horn connection. When using a single horn is pin1 and pin2 group, pin3 and pin4 group, make no mistake.
2. The use of the horn, you need to connect the horn before starting. Do not allow live plug.
3. The default output power of the horn interface is 8R/6W. If a 4R horn is used, the power should be reduced by half accordingly.
4. The maximum power amplifier chip can support power up 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.





3.2.18 Other standard interfaces and features

| Interface | Standard | Parameter Description |
|--------------------|----------------|--|
| Memory interface | TF card | Using the SD3.0 interface specification, the maximum support is Class10, the minimum write/read speed is 10MB/s, and the maximum capacity is 128GB |
| | USB TYPE-A | USB 2.0, up to 480Mbps/s transfer rate (60MB/s) USB 3.0, up to 5.0Gbps/s transfer rate (500MB/s) |
| Ethernet interface | RJ45 interface | Support 10/100M wired network |
| HDMI port | HDMI TYPE-A | HDMI 1.4, 2.0 Supports multiple resolutions, 1920x1080, 1280x720, 720x576, 720x480 etc |
| Headphone jack | 3.5mm | Support left and right dual channels, support MIC recording |
| 4G interface | Mini PCI-E | Support Cat1, Cat4 4G module for network communication Cat1: The downstream peak is about 10Mbps and the upstream peak is 5Mbps Cat4: Downstream peak 150Mbps, upstream 50Mbps The default interface voltage is 3.8V and the power supply current is 3A |
| SIM card interface | Mini SIM | Mini SIM card size: 25mmx15mm Implementation standard: ISO/IEC7810:2003, ID-000 |

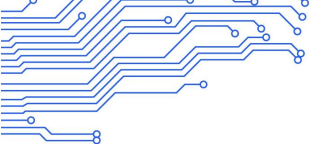


Chapter 4 Electrical performance

| Items | | Min | Typical | Max |
|---|-----------------------|------|---------|-------|
| Power parameter | Voltage | -- | 12V | -- |
| | Ripple | -- | -- | 50mV |
| | Current | 3A | | |
| 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 | -- | -- | 3A |
| Environment | Relative humidity | -- | -- | 80% |
| | Operating temperature | -10℃ | -- | 60℃ |
| | Storage temperature | -40℃ | | 80℃ |

Remark 1: When connecting the LVDS/V-by-one 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 LVDS/V-by-one screen, the overall working current and standby current of the board depend on the connected screen, which are not listed in the above table.

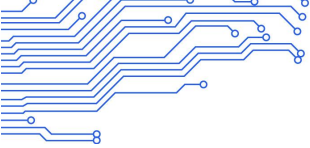


Chapter 5 Minimum test item of the whole machine

Description:

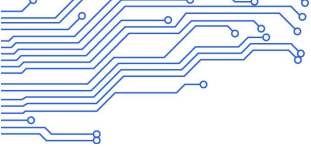
| Minimum test item of stability and reliability of the whole machine | | |
|---|------------------------------------|--|
| Number | Test item | Test detail and description |
| 1 | Basic functional performance test | Test the main function performance of the whole machine, test wifi, Bluetooth, Ethernet, 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°C 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°C environment for 3 days, it can run normally and there are no bad electrical phenomena such as crash, abnormal painting and black screen |
| 5 | 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 |
| 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 $\pm 4\text{KV}$ and air $\pm 8\text{KV}$. Product validation must meet A Grade A or B to be accepted, and C and D grades are nonconformity |
| 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 | 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. Use a vibration tester to test the product. After the test, the structure of the test product is not loose and falling off, and it can operate normally, and there is no crash, abnormal painting, black screen and other |





| | | |
|----|---|--|
| | | electrical defects and structural appearance damage, then it is judged to be 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 |

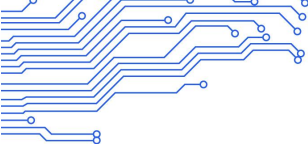




Chapter 6 Configurable parameter table (difference point)

| Type | Standard | | Full function | | High configuration | |
|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| DDR | 2G | <input checked="" type="checkbox"/> | 2G | <input checked="" type="checkbox"/> | 2G | <input type="checkbox"/> |
| | 4G | <input type="checkbox"/> | 4G | <input type="checkbox"/> | 4G | <input type="checkbox"/> |
| | 8G | <input type="checkbox"/> | 8G | <input type="checkbox"/> | 8G | <input checked="" type="checkbox"/> |
| EMMC | 16 | <input checked="" type="checkbox"/> | 16 | <input checked="" type="checkbox"/> | 16 | <input type="checkbox"/> |
| | 32 | <input type="checkbox"/> | 32 | <input type="checkbox"/> | 32 | <input type="checkbox"/> |
| | 64 | <input type="checkbox"/> | 64 | <input type="checkbox"/> | 64 | <input checked="" type="checkbox"/> |
| Wi-Fi+BT | 2.4G+BT | <input checked="" type="checkbox"/> | 2.4G+BT | <input checked="" type="checkbox"/> | 2.4G+BT | <input type="checkbox"/> |
| | 5G+BT | <input type="checkbox"/> | 5G+BT | <input checked="" type="checkbox"/> | 5G+BT | <input checked="" type="checkbox"/> |
| 4G/PCIE | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 5G/M.2 | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| ETH/RJ45 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| SATA3.0 | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| LVDS | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| eDP | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| HDMI | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| USB*6 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| TTL*1 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| RS232*1 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| RS485*1 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| CAN*1 | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| Hdmi in | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| TF | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |





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.

