

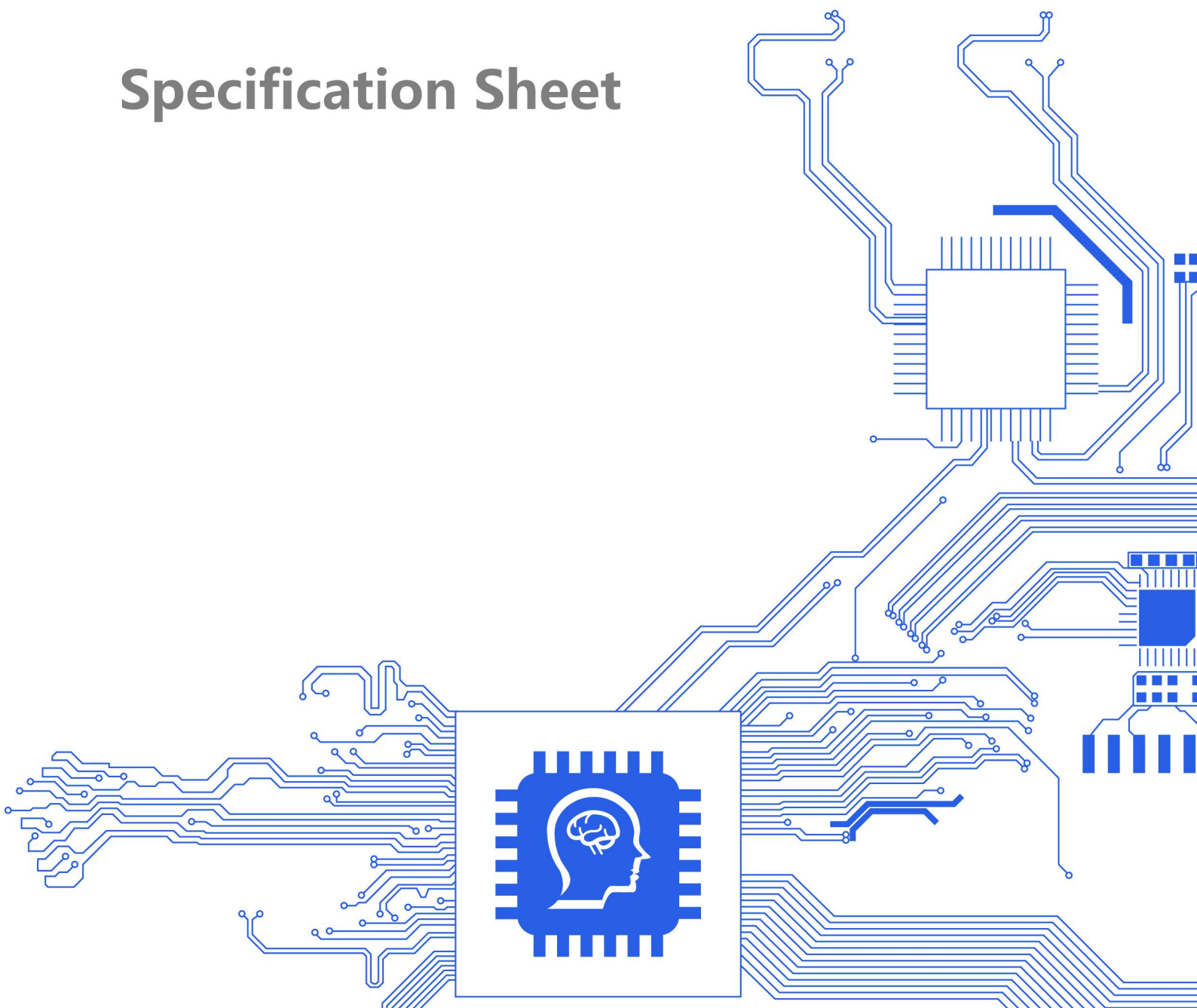
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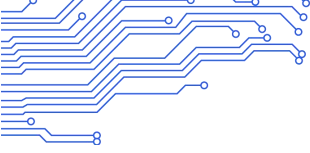
万物智联·数字原生

深圳市视美泰技术股份有限公司

AIOT-133SE V1.1

Specification Sheet





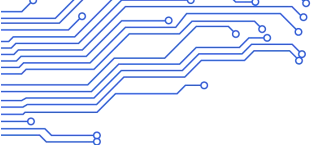
Document Revision History

Version	Revision Content	Revised By	Reviewed By	Date
V1.1	Hardware version update	XXX	XXX	2024-06-26

Statement

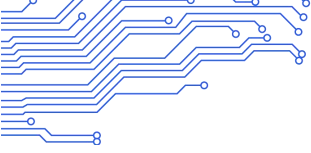
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Chapter 1 Product Overview

1.1 Scope of Application

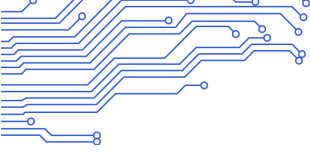
The AloT-133SE adopts the Allwinner A133 (Cortex-A53) quad-core processor, equipped with the Android 10 system and a maximum main frequency of 1.7 GHz, delivering superior performance. It is integrated with the PowerVR GE8300 GPU, supporting 4K and H.265 hardware decoding. With top-tier benchmark performance and decoding capabilities, it is an optimal choice for projects like advertising players.

1.2 Product Overview

The AloT-133SE adopts the Allwinner A133 (Cortex-A53) quad-core processor, equipped with the Android 10 system and a maximum main frequency of 1.7 GHz, delivering superior performance. It is integrated with the PowerVR GE8300 GPU, supporting 4K and H.265 hardware decoding. With top-tier benchmark performance and decoding capabilities, it is an optimal choice for projects like advertising players.

1.3 Product Features

- ◆ High Integration: Integrates LVDS/MIPI and WiFi functions in one, featuring a compact and ultra-thin design with outstanding performance.
- ◆ Rich Expansion Interfaces: Equipped with 5 USB interfaces (supporting up to 5), 2 serial ports (2 TTL serial ports), and GPIO interfaces, compatible with external devices with corresponding interfaces available in the market.
- ◆ High Definition: Supports a maximum decoding resolution of 1080P (1920x1080) and various LCD displays with LVDS/MIPI interfaces, as well as cut-to-size displays of different sizes and resolutions.
- ◆ Support for Android System Customization: Provides system call interface API reference codes, perfectly supporting the development of customers' upper-layer application APPs.
- ◆ Full Compatibility with Multiple Touch Screens: Supports various mainstream touch screens



such as infrared, optical, capacitive, resistive, and touch film screens. It also supports HID configuration for driver-free touch screens, requiring no debugging.

1.4 Appearance and Interface Diagram

Front/Back Side:

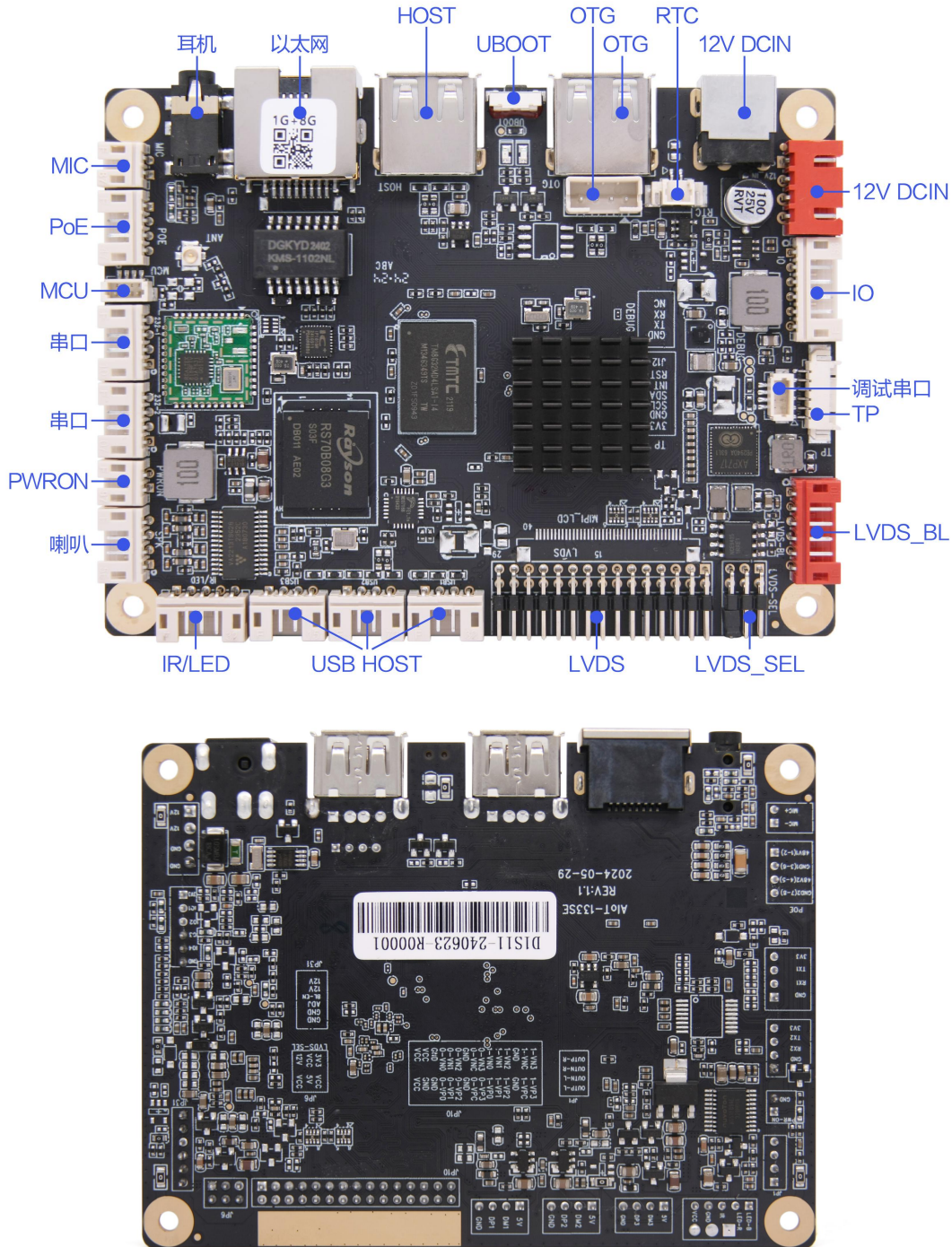
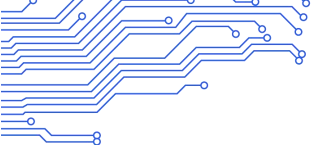
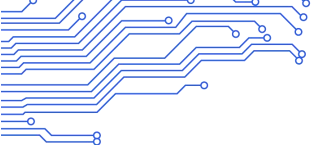


Photo Statement: The above photos are taken of a batch of motherboards produced by our company. Due to continuous product maintenance and optimization, the actual delivered motherboards may differ slightly from the photos.



Chapter 2 Basic Function List

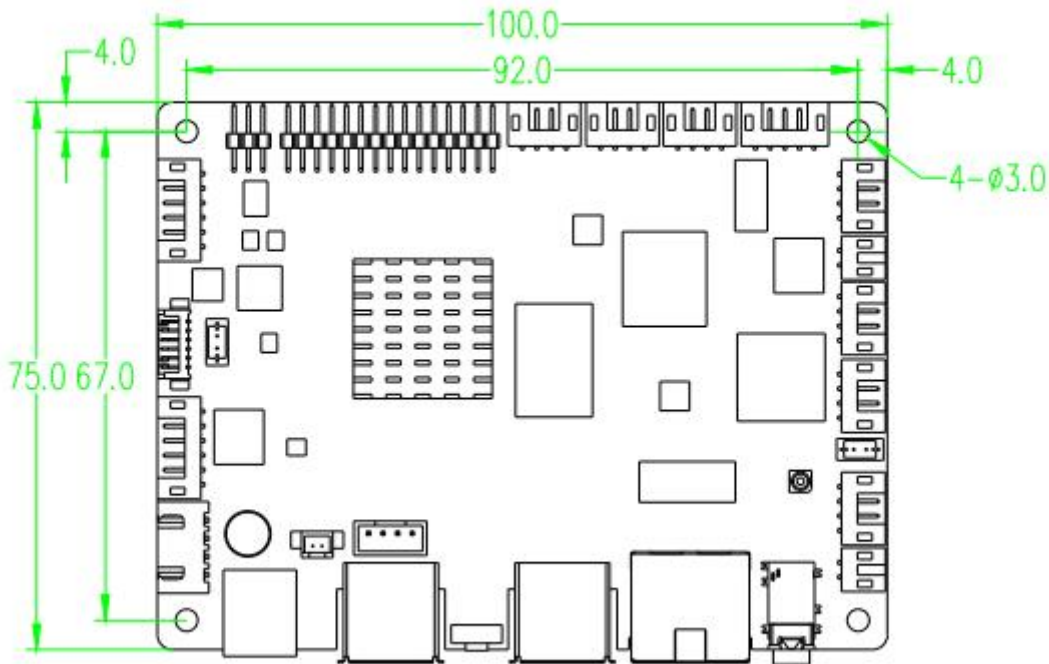
Main Function Parameter	
Size	100*75mm
CPU	A133, quad-core, maximum main frequency up to 1.7GHz
OS	Android 10.0
Memory / Storage	Standard: 1G (2G optional) / Standard: 8G (16/32/64G optional)
Built-in ROM	2KB EEPROM (not included by default, optional for installation)
LVDS Output	1 single/double channel, capable of directly driving LCD screens with 50/60Hz (alternative to MIPI)
MIPI Output	Capable of directly driving MIPI LCD screens with various resolutions (alternative to LVDS)
Supported Video Formats	wmv, avi, flv, rm, rmvb, mpeg, ts, mp4, etc.
Supported Image Formats	BMP, JPEG, PNG, GIF
Audio Input/Output	Speaker output (supporting left and right channel output, built-in dual 6W/8Ω power amplifiers), MIC IN
USB Interfaces	5 channels (1 USB OTG, 4 USB HOST)
Serial Port/Expansion Interfaces	2 serial ports (2 TTL serial ports, configurable to RS232), 1 IIC, 4 GPIO interfaces
Network Support	1. Supports 10/100M adaptive Ethernet 2. Built-in WiFi, supporting hotspot sharing
Memory Card	No supported
RTC (Real-Time Clock)	Supported, with scheduled power-on/off function
System Upgrade	Supports local USB upgrade



Chapter 3 PCB Dimensions and Interface

Layout

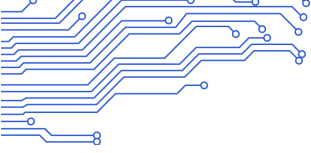
3.1 PCB Size Image



PCB: 6-layer board, thickness 1.6mm

PCBA: L * W = 100mm * 75mm, MAX H = 11.0±0.3mm

Screw Hole Specification: ϕ 3.2mm x 4



3.2 Interface Parameter Description

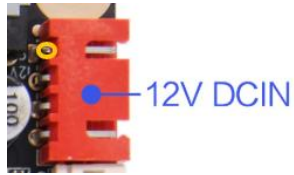
Note on Image Labeling: The circle mark  on the socket interface images indicates Pin 1.

Power Input Interface (4pin/2.54mm)

The motherboard is powered by a 12V DC power supply. Power can only be supplied to the system through the DC jack and power socket. The DC IN specification of the power adapter plug is D6.0, d2.0. Under no-load conditions (without connecting external devices), the 12V DC power supply must support a minimum current of 600mA.

The electrical definition of this interface is as follows:

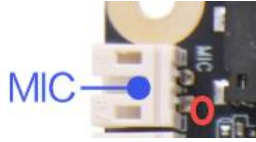
Pin No.	Definition	Attribute	Description
1	12V	Input	12V input
2	12V	Input	12V input
3	GND	Ground	Ground wire
4	GND	Ground	Ground wire



MIC Interface (2pin/2.0mm)

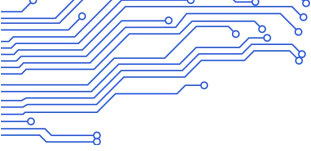
Please pay attention to the positive and negative polarity of the MIC during connection; reverse connection is prohibited.

Pin No.	Definition	Attribute	Description
1	MIC-	Input	MIC-
2	MIC+	Input	MIC+



Status Indicator Light

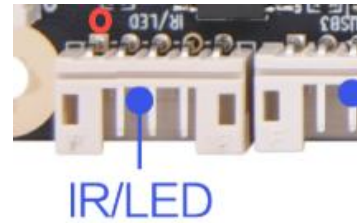
Indicator Light Color Description: Red when powered on, blue after the system starts.



Expansion Indicator Light Interface (5pin/2.0mm)

The motherboard reserves a set of external interfaces for dual-color indicator lights, with the following definitions:

Pin No.	Definition	Attribute	Description
1	LED-B	Positive	Connect to the anode of the indicator light
2	LED-R	Positive	Connect to the anode of the indicator light
3	IR	Output	Infrared (IR) signal
4	GND	Ground	Ground wire
5	VCC	Power Supply	3.3V output

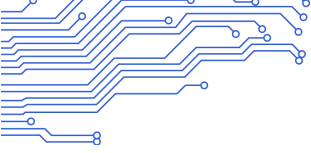


Backlight Control Interface (6pin/2.0mm)


Used for backlight control of LVDS screens. The 12V power supply current shall not exceed 1.5A. When using large screens above 19 inches or screens with backlight power exceeding 20W, the backlight power supply should be taken from another power board to avoid system instability. **The 12V power supply in the backlight socket can only be used as backlight power output; it is strictly prohibited to use it as a power input for the motherboard.**

Pin No.	Definition	Attribute	Description
1	12V	Power Supply	12V output
2	12V	Power Supply	12V output
3	BL-EN	Output	Backlight enable control
4	ADJ	Output	Backlight brightness ADJ control
5	GND	Ground	Ground wire
6	GND	Ground	Ground wire



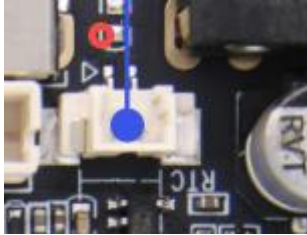


Power On/Off Button Interface (2pin/2.0mm)

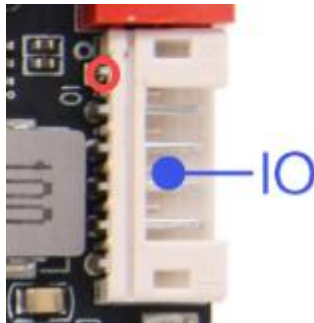
Pin No.	Definition	Attribute	Description	
1	PWR-ON	Input	Connect to one pin of the external power button	
2	GND	Ground	Ground wire, connect to the other pin of the external button	

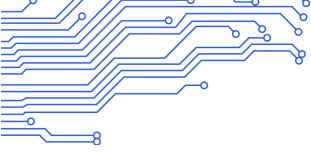
RTC Battery Interface (2pin/1.25mm)

Adopts a 2pin Wafer socket with a 1.25mm pitch, used to supply power to the system clock when the power is off.

Pin No.	Definition	Attribute	Description	
1	RTC	Input	3V input	
2	GND	Ground Wire	Ground wire	

IO Interface (6pin/2mm)

Pin No.	Definition	Attribute	Description	
1	VCC	Power Supply	3.3V Output	
2	IO1	I/O	IO1	
3	IO2	I/O	IO1	
4	IO3	I/O	IO1	
5	IO4	I/O	IO4	
6	GND	Ground Wire	Ground Wire	



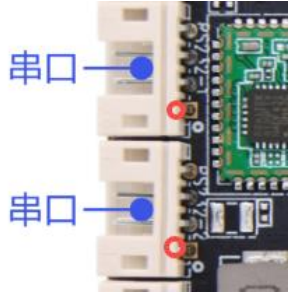
TTL Serial Port Socket Interface (4pin/2.0mm)

The motherboard has 2 sets of standard two-wire serial ports 引出, supporting common serial devices on the market. The serial port level ranges from 0V to 3.3V. If the level of the connected serial device is higher than 3.3V, an isolation circuit or level conversion circuit must be used; otherwise, the main controller and the device may be damaged. It is TTL by default and can be reconfigured to RS232.

Precautions:

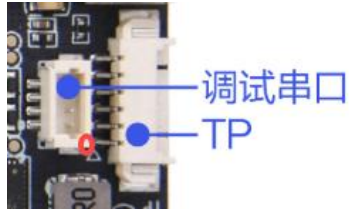
1. Check the matching of TTL serial port voltage. Do not directly connect to MAX232 or 485 devices.
2. Ensure correct connection of TX and RX pins.

Pin No.	Definition	Attribute	Description
1	GND	Ground	Ground wire
2	UART-RX	Input	RX3
3	UART-TX	Ground wire	TX3
4	VCC	Power Supply	5V output



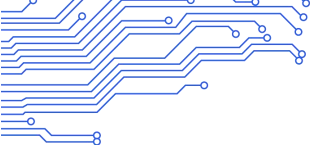
TP Interface (6pin/1.25mm)

Pin No.	Definition	Attribute	Description
1	VCC	Power Supply	3.3V output
2	GND	Power Supply	Ground wire
3	SCL	I/O	I2C Clock
4	SDA	I/O	I2C data
5	INT	I/O	Interrupt
6	RST	I/O	Reset



LVDS Screen Interface (15pin*2/2.0mm)

Adopts a universal LVDS interface definition, supporting single/double channel, 6/8-bit 1080P LVDS screens. The screen voltage can be selected via a jumper cap, supporting 3.3V/5V/12V screen power



supply.

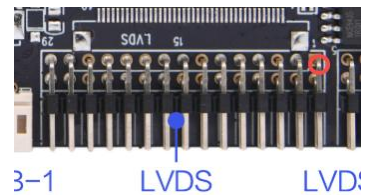
To avoid damage to the motherboard and the screen, please note the following:

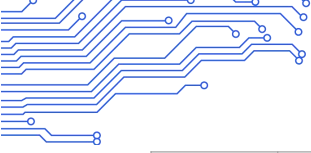
1. Confirm whether the screen power supply voltage specified in the screen specification sheet is correct, and whether the corresponding power supply of the motherboard can meet the maximum operating current of the screen.
2. Use a multimeter to confirm the power supply selected by the jumper cap is correct.

In the diagram below, the jumper cap is used to select the screen power supply. From left to right, the options are: 3.3V/5V/12V.

The electrical definition of the 15*2 pin LVDS output is as follows:

Pin No.	Definition	Attribute	Description
1	PVCC	Power Output	LCD power output, +3.3V/+5V/+12V optional
2			
3			
4	GND	Ground Wire	Groud 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	Ground Wire
14	GND	Ground	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	Ground Wire





26	GND	Ground	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)	

MIPI Screen Interface (40pin/0.5mm)


This interface is a 40-pin FPC socket with a pitch of 0.5mm. It is not mounted by default and is an alternative output to LVDS.

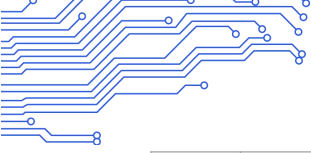
To avoid damaging the board and the screen, please note the following:

1、 Please confirm whether the power supply voltage, current and other parameters of the screen specified in the screen specification sheet match the board. **The default LED backlight drive current of the board is ***mA. If it does not meet the current parameter requirements of the selected screen, the output current can be adjusted by changing the resistance value of R143 = R5106. The formula is: $I(\text{led}) = 200\text{mV}/R5106$. [R5106 default = 3R3]. The following is a common matching list of current and resistance [specific values should be determined according to the actual screen specification sheet]::**

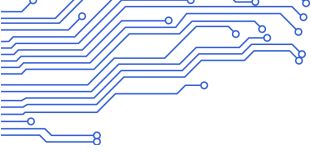
2、 Confirm that the wire sequence electrical definition of the screen interface and the board interface is consistent, and the FPC screen cable is selected correctly.

The electrical definition of the screen interface is as follows :

Pin No.	Definition	Attribute	Description	
1	VDD_1V8	Power supply	1.8V Input	
2	VDD_3V3	Power supply	3.3V Output	
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	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	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	Ground Wire
14	MIPI_CKN	Output	MIPI Port clock negative output
15	MIPI_CKP	Output	MIPI Port clock positive output
16	GND	Ground	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	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	Ground Wire
23	NC	NC	NC
24	NC	NC	NC
25	GND	Ground	Ground Wire
26	NC	NC	NC
27	NC	NC	NC
28	NC	NC	NC
29	NC	NC	NC
30	GND	Ground	Ground Wire
31	LED-	Power supply	LCD backlight power supply -
32	LED-	Power supply	
33	NC	NC	NC
34	NC	NC	NC
35	NC	NC	NC
36	NC	NC	NC
37	NC	NC	NC
38	NC	NC	NC
39	LED+	Power supply	LCD backlight power supply +
40	LED+	Power supply	

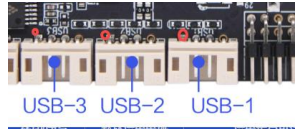


USB (4pin/2.0mm)

The board has 3 USB interfaces. Among them, there are 3 interfaces in the form of 4-pin sockets with a pitch of 2.0mm, which can be used for peripheral expansion. They are HOST by default, and the power supply current is not more than 1A.

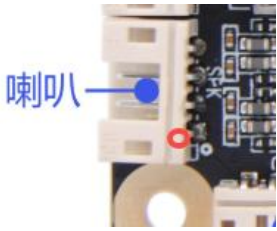
The electrical definition of the USB socket is as follows:

Pin No.	Definition	Attribute	Description
1	VCC	Power supply	5V Output
2	DM	I/O	DM
3	DP	I/O	DP
4	GND	Ground	Ground wire



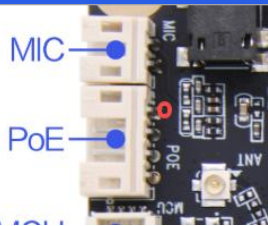
Speaker Interface (4pin/2.0mm)

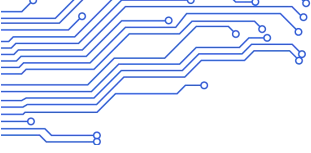
Pin No.	Definition	Attribute	Description
1	OUTP-R	Output	Audio output right +
2	OUTN-R	Output	Audio output right -
3	OUTN-L	Output	Audio output left -
4	OUTP-L	Output	Audio output left +



POE Interface (4pin/2.0mm)

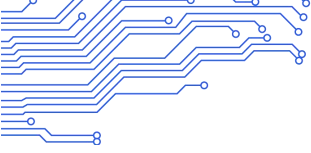
Pin No.	Definition	Attribute	Description
1	A-48V	Output	POE power signal
2	A-48V	Output	POE power signal
3	B-48V	Output	POE power signal
4	B-48V	Output	POE power signal





Some Other Standard Interfaces and Functions

Storage Interface	USB TYPE-A	SB TYPE-A, USB 2.0, supporting a maximum transmission rate of 480Mbps/s (60MB/s)
Ethernet Interface	RJ45interface	supporting 10/100M wired network
Headphone Interface	3.5mm	3.5mm, supporting left and right dual channels and MIC recording

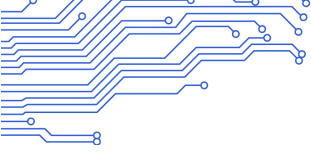


Chapter 4 Electrical Performance

Item	Minimum	Typical	Maximum	
Power Supply Parameters	Voltage	--	12V	
	Ripple	--	50mV	
	Current	2A		
Power Supply Current (LVDS)	Operating Current at 3.3V	400 mA	500mA	
	Operating Current at 5V	550 mA	2A	
	Operating Current at 12V	580 mA	2A	
	USB Supply Current	--	--	1A
Power Supply Current (MIPI)	Operating Current at 3.3V	300 mA	600 mA	
	USB Supply Current	--	--	1A
Total Output	Current	3.3V	500mA	
Environment	Relative Humidity	--	--	80%
	Operating Temperature	0°C	--	60°C
	Storage Temperature	-40°C		80°C

Notes:

1. When connecting an LVDS screen, please note to select the correct backlight operating voltage (3.3V, 5V, or 12V). Users must not apply it to peripherals that exceed the corresponding maximum current.
2. When connecting an LVDS/MIPI screen, the overall operating current and standby current of the board depend on the connected screen and are not listed one by one in the above table.



Chapter 5 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.