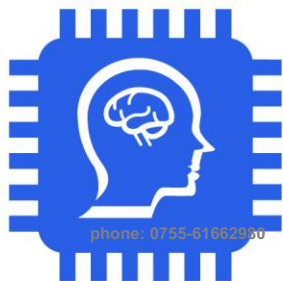


IoT-3288X V1.2

Product specification

Gate main board



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Document revision history

version number	modify the content	Revision	Review	date
V1.0	Initial version	XXX	XXX	2019-07-30

statement

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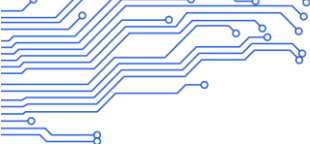
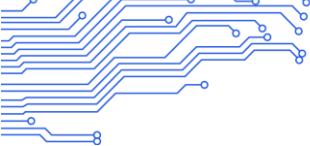


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Chapter One Product Overview

1.1 Scope of application

IoT-3288X It belongs to the intelligent gate main board, which is generally applicable to: gates, access control equipment, attendance machines, intelligent self-service terminals, industrial control h

Robot equipment, etc.

1.2 product description

IoT-3288X Rockchip RK3288 Cortex-A17 Quad-core processor with Android7.1 System, frequency up to 1.8 GHz ,

Super performance. use Mali-T764 GPU ,stand by 4K , H.265 Hard decoding. Whether it's running scores or decoding, it's superb. It's you

The best choice for projects such as human-computer interaction and face recognition.

1.3 Features

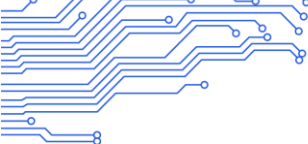
- High integration. integrated HDMI/LVDS/MIPI/eDP/WIFI/ Bluetooth is multi-functional, simple and ultra-thin, outstanding.
- Can be built-in PCI-E 4G Module. Support Huawei/Longshang, etc. PCI-E 3G/4G Module goes online.
- Rich expansion interface. 4 A USB Interface (supports up to 5), 3 Serial port (1 road 232 Serial port, 1 road 485 Serial port, 1 road TTL

Serial port), GPIO/ADC The interface can match the peripherals of the corresponding interface on the market.

- High definition. Maximum support 4K 3840x2160 Decoding and various LVDS/MIPI/eDP Interface LCD Display, support all sizes

The screen is cropped in inches and resolutions.

- stand by Android System customization, providing system call interface API Reference code, perfect support for customer upper-level applications APP Development.
- It perfectly supports a variety of mainstream touch screens such as infrared, optical, capacitance, resistance, touch film, etc., and supports drive-free touch screens HID Configuration without debugging.



1.4 Appearance and interface diagram

front back:

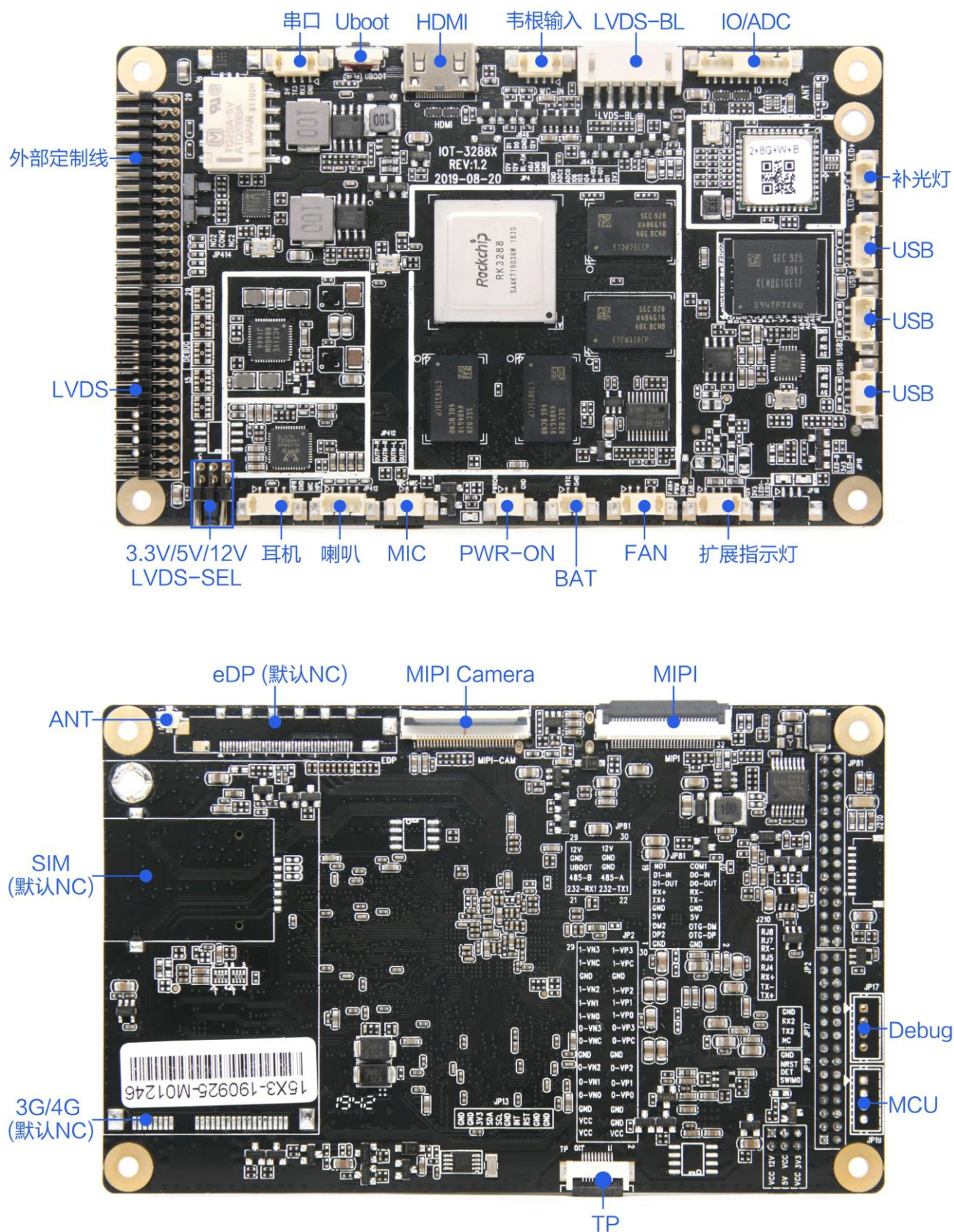
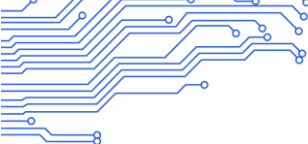
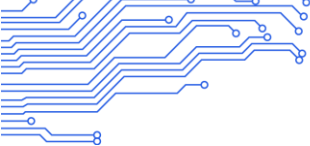


Photo statement: The above photos are taken from a certain batch of boards produced by our company. Due to the continuous maintenance of the products, the actual boards may not be consistent with the photos.



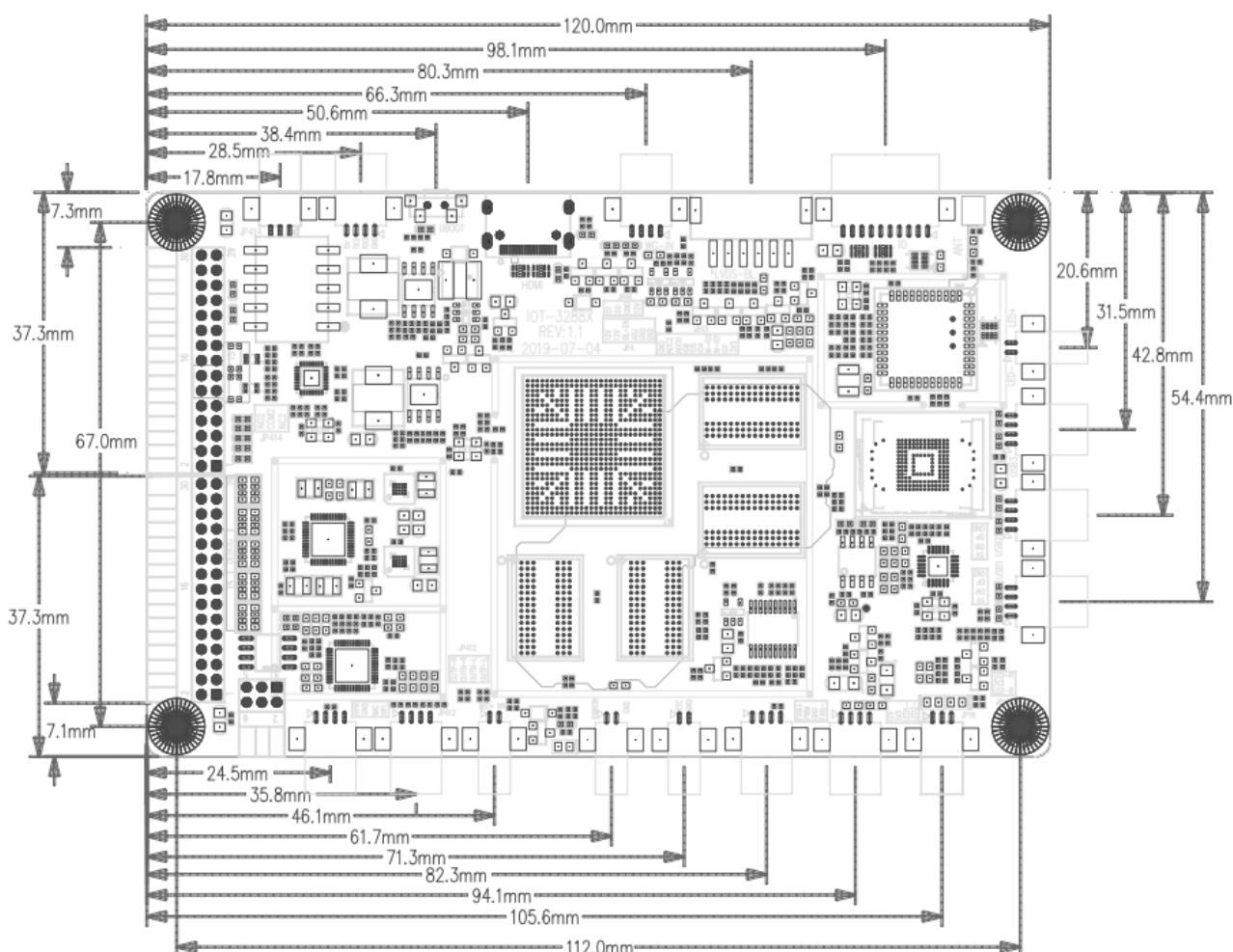
Chapter 2 List of Basic Functions

Main function parameters	
Board size	120*75mm
CPU	RK3288, Quad-core, the highest frequency 1.8GHz , Android 7.1
Memory/storage	Standard 2G (4G Optional) / standard 8G (16/32/64G Optional)
Built-in ROM	2KB EEPROM (Not included by default, post is optional)
LVDS Output	1 Single/dual circuit, can be driven directly 50 / 60Hz LCD screen
MIPI Output	Can directly drive multiple resolutions MIPI LCD screen
eDP Output	Can directly drive multiple resolutions eDP Interface LCD screen
Video format support	stand by wmv , avi , flv , rm , rmvb , mpeg , ts , mp4 Wait
Picture format support	stand by BMP , JPEG , PNG , GIF
Audio input/output	Speaker output (support left and right channel output, built-in dual 2.5W / 4R , 1.25W / 8R Power amplifier), MIC IN
USB interface	5 road(1 A USB OTG , 4 A USB HOST)
Serial port	1 A 232 Serial port, 1 A 485 Serial port, 1 A TTL Serial port
Network support	1 ,stand by 10/100M Adaptive Ethernet 2 , Built-in WiFi , Support hotspot sharing, support Bluetooth 4.0 (Standard configuration) 3 , Customizable built-in PCI-E interface 3G/4G Internet, default NC
Wiegand interface	Support one output, one input
RTC Real Time Clock	Support, support timing switch
System Upgrade	Support local USB upgrade



Chapter 3 PCB Size and Interface Layout

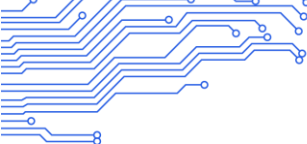
1.5 PCB Dimensions



PCB : 8 Laminate, thickness 1.6mm

PCBA : L x W=120mm*75mm , MAX H =

Screw hole specifications: $\varnothing 3.2\text{mm} \times 4$



1.6 Interface parameter description

Picture annotation description: the point of the arrow on the socket interface picture indicates the first foot.

External custom line interface (15pin*2/2.0mm)

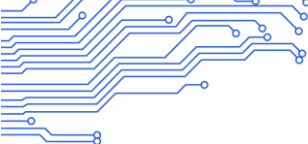
The form of the interface is 15x2 Double-row pin form, which contains power input, Wiegand input/output, RJ45 And other functional interfaces. Power input adopts 12 V DC power supply. When the board is not connected to the peripheral empty load, 12V DC power supply needs to support minimum 600mA Current. In the interface USB OTG Interface, default is Host Mode, you can go through the menu " Set up • USB • Connected to PC" Option to configure as

Device mode. The electrical definition of this interface is as follows:

Serial number	definition	Attributes	description
1	GND	Ground wire	Ground wire
2	GND	Ground wire	Ground wire
3	HOST_DP	Input/out	USB HOST mouth D+ signal
4	OTG_DP	Input/out	USB OTG mouth D+ signal
5	HOST_DM	Input/out	USB HOST mouth D- signal
6	OTG_DM	Input/out	USB OTG mouth D- signal
7	VBUS_5V	power supply	USB HOST power supply
8	VBUS_5V_OTG	power supply	USB OTG power supply
9	GND	Ground wire	Ground wire
10	GND	Ground wire	Ground wire
11	TX+	Output	Tranceive Data+ (Signal +)
12	TX-	Output	Tranceive Data- (Send signal-)
13	RX+	enter	Receive Data+ (Receive signal+)
14	RX-	enter	Receive Data- (Receive signal -)
15	WGOUT_D1	Output	Wiegand Signal D1 Output
16	WGOUT_D0	Output	Wiegand Signal D0 Output
17	WGIN_D1	enter	Wiegand Signal D1 enter
18	WGIN_D0	enter	Wiegand Signal D0 enter
19	JDQ_NO1	/	Relay normally open
20	COM1	/	Relay common
twenty one	232_RXD1	enter	232-RX1
twenty two	232_TXD1	Output	232-TX1
twenty three	RS485_B	Input/out	485 Serial port 4 Communication-
twenty four	RS485_A	Input/out	485 Serial port 4 Communication+
25	Uboot	enter	External upgrade button
26	GND	Ground wire	Ground wire
27	GND	Ground wire	Ground wire
28	GND	Ground wire	Ground wire
29	12V-IN	power supply	12V enter
30	12V-IN	power supply	12V enter


外部定制线





MIC interface(2pin/1.25mm)

caution MIC Do not reverse the connection of the positive and negative poles.

Serial number	definition	Attributes	description	
1	MIC+	enter	MIC+	
2	MIC-	enter	MIC-	


Status Indicator

Indicator color description: red when power on, blue after power on.



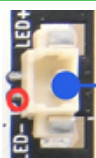
Expansion indicator interface (4pin/1.25mm)

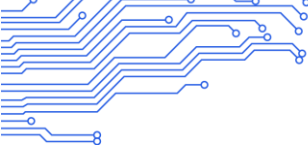
The board reserves a set of external interfaces that can be used as two-color indicator lights, which are defined as follows:

Serial number	definition	Attributes	description	
1	12V	power supply	12V Output, connect to indicator anode	 扩展指示灯
2	3V3	power supply	3.3V Output, connect to indicator anode	
3	LED1-	Output	Connect the cathode of a certain indicator, the function can be customized	
4	LED2-	Output	Connect another indicator light cathode, the function can be customized	

Fill light (constant current) interface (2pin/1.25mm)

The board is designed with an interface that can drive the constant current fill light board, and the drive current is default 60mA .

Serial number	definition	Attributes	description	
1	LED-	Output	Connect the negative pole of the fill light board	 补光灯
2	LED+	Output	Connect the positive pole of the fill light board	

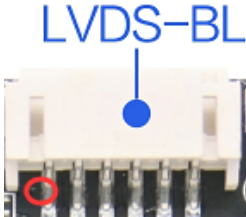


Backlight control interface (6pin/2.0mm)


Used for LVDS Backlight control of the screen, 12V Supply current is not greater than 1.5A When using 19 The power of the large screen or screen backlight above 20W To

When it is connected, please take power from other power supply boards to avoid system instability. **In the backlight socket 12V Power can only be used as backlight**

Power output is strictly prohibited to be used as a power input to supply the motherboard.

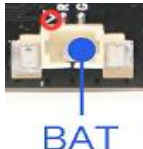
Serial number	definition	Attributes	description	
1	12V	power supply	12V Output	
2	12V	power supply	12V Output	
3	BL-EN	Output	Backlight enable control	
4	ADJ	Output	Backlight brightness ADJ control	
5	GND	Ground wire	Ground wire	
6	GND	Ground wire	Ground wire	

Switch button interface (2pin/1.25mm)

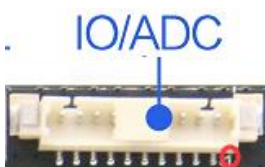
Serial number	definition	Attributes	description	
1	PWR-ON	enter	A pin of the external switch button	
2	GND	Ground wire	Ground wire, the other pin of the external button	

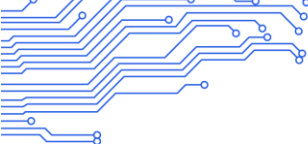
RTC Battery interface (2pin/1.25mm)

use 2pin 1.25mm Spaced Wafer Socket interface, used to power the system clock when the power is off.

Serial number	definition	Attributes	description	
1	RTC	enter	3V enter	
2	GND	Ground wire	Ground wire	

IO/ADC interface(10pin/1.25mm)

Serial number	definition	Attributes	description	
1	VCC	power supply	3.3V Output	
2	IO1	Input/out	IO1	
3	MCU-IO1	Input/out	MCU-IO1	
4	MCU-IO2	Input/out	MCU-IO2	



5	IO4	Input/out	IO4
6	IO5	Input/out	IO5
7	IO6	Input/out	IO6
8	ADC0	enter	ADC0 signal
9	ADC2	enter	ADC2 signal
10	GND	Ground wire	Ground wire

TTL Serial socket interface (4pin/1.25mm)


The board leads 1 Group of ordinary two-wire serial port (serial port 3), which can support common serial devices on the market, the level of the serial port is 0V To 3.3V . in case

The level of the connected serial port is higher than 3.3V When there is an isolation circuit or a level conversion circuit, it will burn out the main control and equipment.

Precautions:

1 , TTL Whether the serial port voltage matches. Cannot directly access MAX232 , 485 equipment.

2 , TX , RX Whether the connection method is correct.


Serial number	definition	Attributes	description	
1	GND	Ground wire	Ground wire	
2	UART-RX	enter	RX3	
3	UART-TX	Output	TX3	
4	VCC	power supply	5V Output	

TP Interface (rear, 10pin/0.5mm)


Serial number	definition	Attributes	description	
10	GND	Ground wire	Ground wire	
9	GND	Ground wire	Ground wire	
8	3V3	power supply	3.3V Output	
7	SDA	Input/out	I2C data	
6	SCL	Input/out	I2C clock	
5	GND	Ground wire	Ground wire	
4	INT	Input/out	Interrupt	
3	RST	Input/out	Reset	
2	GND	Ground wire	Ground wire	
1	GND	Ground wire	Ground wire	

Wiegand input interface (4pin/1.25mm)



Serial number	definition	Attributes	description	
1	12V	power supply	12V Output	
2	GND	Ground wire	Ground wire	
3	WGIN_D0	enter	Wiegand Signal D0 enter	
4	WGIN_D1	enter	Wiegand Signal D1 enter	

fan(FAN)interface(4pin/1.25mm)

Serial number	definition	Attributes	description	
1	FAN+	Power+	5V Output	
2	PWM	Output	Rotating speed pwm adjust	
3	GND	Ground wire	Ground wire	
4	FAN-	power supply-	power supply-	

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

generic LVDS Interface definition, support single/double, 6/8 Bit 1080P LVDS Screen. The screen voltage can be selected by jumper caps,

hold 3.3V/5V/12V Screen power supply.

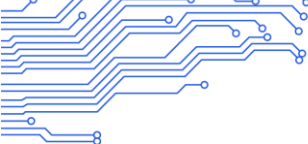
In order to avoid burning the board and screen, please pay attention to the following:

- 1 , Please confirm whether the screen power supply voltage 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.

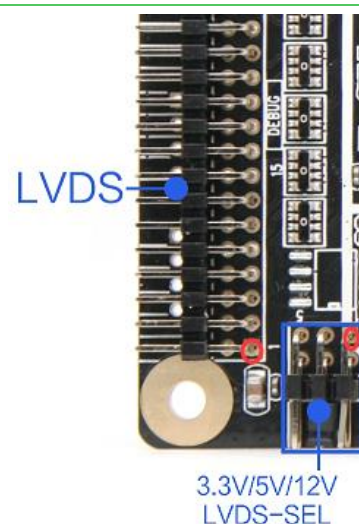
In the following figure, jumper caps are used to select the screen power supply, from left to right, in order: 3.3V/5V/12V.

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

Serial 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)
twenty one	1-VN1	Output	Pixel1 Negative Data (Even)
twenty two	1-VP1	Output	Pixel1 Positive Data (Even)
twenty three	1-VN2	Output	Pixel2 Negative Data (Even)
twenty four	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)



MIPI Screen interface (rear, 32pin/0.5mm)

The interface form is 32pin 0.5mm Spaced FPC socket.

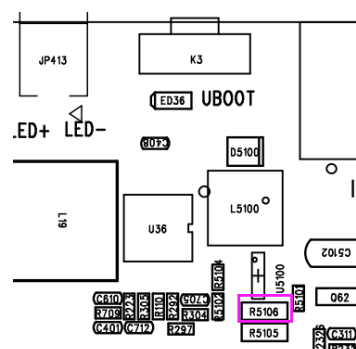
In order to avoid burning the board and screen, please pay attention to the following:

1 , Please confirm whether the parameters such as the power supply voltage and current of the screen specifications match the board. **Board default led The driving current of the backlight is 60mA ,**

If it does not meet the current parameter requirements of the selected screen, you can adjust R5106 The resistance value to adjust the output current, the formula: $I(\text{led})=200\text{mV}/R5106$.

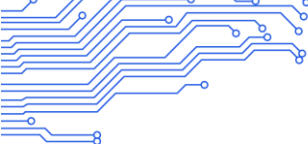
[R5106 Default= 3R3], the following is a list of common current and resistance matching [The specific value should also be determined by the actual screen specification]:

MIPI Screen	Screen backlight current	R5106 Resistance
5 Inch	40mA	5R1
7 Inch	60mA	3R3
7 Inch	80mA	2R7
10.1 Inch	180mA	1R1
10.1 Inch highlight screen	350mA	1R1/1R2

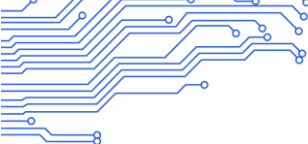


2 , Confirm that the screen interface is consistent with the electrical definition of the line sequence of the board interface, FPC The screen line is selected correctly.

The electrical definition of the screen interface is as follows:



Serial number	definition	Attributes	description	
1	VDD_5V	power supply	Screen power output, 5V 1A	
2	VDD_5V	power supply		
3	NC	--	empty link	
4	VDD	power supply	Screen power output, 3.3V	
5	VDD	power supply		
6	Reset	Output	Screen reset signal, high level 3.3V	
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	
twenty one	MIPI_D3P	Output	MIPI Port Lane 3 positive output	
twenty two	GND	Ground wire	Ground wire	
twenty three	GND	Ground wire	Ground wire	
twenty four	BL-EN	Output	Backlight enable signal output	
25	PWM	Output	Backlight pwm control	
26	PWM OUT	enter	On screen PWM Adjust the backlight signal output	
27	GND	Ground wire	Ground wire	
28	LED-	power supply	LCD Backlight power supply	
29	LED-	power supply		
30	NC	--	empty link	
31	LED+	power supply	LCD Backlight power supply+	
32	LED+	power supply		

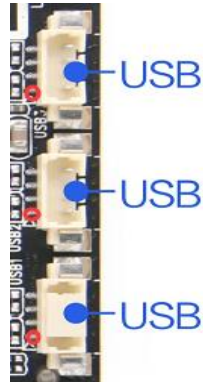


USB (4pin/1.25mm)

The board has 5 A USB Interface, where 2 Are located in the external custom line interface, 4Pin 1.25mm Pitch sockets are available 3 Can be used for

Peripheral expansion, the default is HOST , The power supply current is not greater than 1A .

USB The electrical definition of the socket is as follows:

Serial number	definition	Attributes	description	
1	VCC	power supply	5V Output	
2	DM	Input/out	DM	
3	DP	Input/out	DP	
4	GND	Ground wire	Ground wire	

MIPI Camera Interface (rear, 30pin/0.5mm)

Maximum board support 1400w Pixel mipi Camera, installed in JP26 The electrical definition of the socket is as follows:

Serial number	definition	Attributes	description	
1	NC	/	/	
2	VDD	power supply	2.8V Output	
3	DVDD	power supply	1.2V Output	
4	DOVDD	power supply	1.8V Output	
5	NC	/	/	
6	GND	Ground wire	Ground wire	
7	VDD	power supply	2.8V Output	
8	GND	Ground wire	Ground wire	
9	I2C3_SDA	Input/out	SDA signal	
10	I2C3_SCL	Output	SCL signal	
11	RST	Output	Reset signal	
12	PWDN	Output	Power down control	
13	GND	Ground wire	Ground wire	
14	MCLK	Output	Master clock	
15	GND	Ground wire	Ground wire	
16	D3P	Input/out	mipi Data channel 3 positive	
17	D3N	Input/out	mipi Data channel 3 negative	
18	GND	Ground wire	Ground wire	
19	D2P	Input/out	mipi Data channel 2 positive	

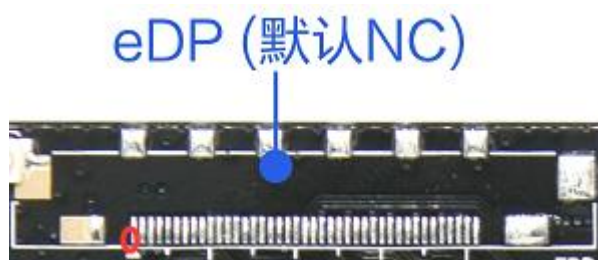


20	D2N	Input/out	mipi Data channel 2 negative
twenty one	GND	Ground wire	Ground wire
twenty two	D1P	Input/out	mipi Data channel 1 positive
twenty three	D1N	Input/out	mipi Data channel 1 negative
twenty four	GND	Ground wire	Ground wire
25	CLKP	Input/out	mipi Clock channel positive
26	CLKN	Input/out	mipi Clock channel negative
27	GND	Ground wire	Ground wire
28	D0P	Input/out	mipi Data channel 0 positive
29	D0N	Input/out	mipi Data channel 0 negative
30	GND	Ground wire	Ground wire

eDP Interface (rear, default NC , 41pin/0.5mm)

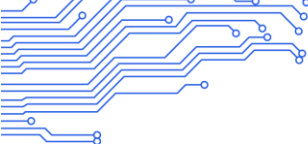
The interface is 41pin Screen interface. The default screen voltage is 3.3V Screen power supply, can be selected by the resistance bit reserved on the board 5V Output. cut

The figure description is as follows:




41pin The electrical definition of the screen interface is as follows:

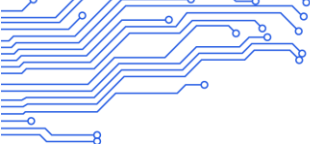
Serial number	definition	Attributes	description
1	NC	--	empty link
2	12V	power supply	12V Output
3	12V	power supply	12V Output
4	12V	power supply	12V Output
5	12V	power supply	12V Output
6	NC	--	empty link
7	NC	--	empty link
8	BL-PWM	Output	Backlight brightness pwm control
9	BL-EN	Output	Backlight enable control
10	GND	Ground wire	Ground wire
11	GND	Ground wire	Ground wire
12	GND	Ground wire	Ground wire
13	GND	Ground wire	Ground wire
14	eDP_HPD	enter	Screen hot plug detection signal, screen output




15	GND	Ground wire	Ground wire
16	GND	Ground wire	Ground wire
17	NC	--	empty link
18	PVCC	power supply	eDP LCD power output
19	PVCC	power supply	eDP LCD power output
20	GND	Ground wire	Ground wire
twenty one	AUX-	Output	Display Port AUX- chanenl negative singal
twenty two	AUX+	Output	Display Port AUX+ chanenl positive singal
twenty three	GND	Ground wire	Ground wire
twenty four	D0+	Output	Display Port Lane 0 positive output
25	D0-	Output	Display Port Lane 0 negative output
26	GND	Ground wire	Ground wire
27	D1+	Output	Display Port Lane 1 positive output
28	D1-	Output	Display Port Lane 1 negative output
29	GND	Ground wire	Ground wire
30	NC	--	empty link
31	GND	Ground wire	Ground wire
32	D2+	Output	Display Port Lane 2 positive output
33	D2-	Output	Display Port Lane 2 negative output
34	GND	Ground wire	Ground wire
35	D3+	Output	Display Port Lane 3 positive output
36	D3-	Output	Display Port Lane 3 negative output
37	GND	Ground wire	Ground wire
38	GND	Ground wire	Ground wire
39	GND	Ground wire	Ground wire
40	GND	Ground wire	Ground wire
41	NC	--	empty link

Headphone jack interface (4pin/1.25mm)

Serial number	definition	Attributes	description	
4	HPL	Output	Audio output left	
3	HS-MIC	enter	headset MIC enter	
2	GND	Ground wire	Ground wire	
1	HPR	Output	Audio output right	

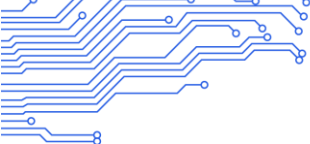


Speaker interface (4pin/1.25mm)

Serial 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+	

Some other standard interfaces and functions

HDMI interface	Standard interface	stand by HDMI Data output, maximum support 1080P
3/4G Interface (default NC)	PCI-E Standard interface	Support Huawei, ZTE, etc. Mini PCI-E 3G/4G Module
SIM Card interface (default NC)	Standard interface	Support various formats (depending on 3/4G Module)



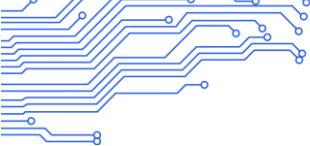
Chapter 4 Electrical Performance

project		The smallest	typical	maximum
Power parameters	Voltage	--	12V	--
	Ripple	--	--	50mV
	Current	2A		
Power supply current (LVDS)	3.3V Working current		400 mA	1A
	5V Working current		550 mA	2A
	12V Working current		580 mA	2A
	USB Supply current	--	--	1A
Power supply current (MIPI)	3.3V Working current		300 mA	600 mA
	USB Supply current	--	--	1A
Total output	Current	3.3V		800mA
surroundings	Relative humidity	--	--	80%
	Operating temperature	-10 °C	--	60 °C
	storage temperature	-40 °C		80 °C

Remark 1: Connect LVDS When screen, please pay attention to choose the correct backlight working voltage 3.3V, 5V, 12V , The user cannot apply it beyond the corresponding

The maximum current of the peripheral.

Remark 2: Connect LVDS/MIPI When the screen is on, the overall working current and standby current of the board depend on the connected screen, which is not listed in the above table.



Chapter 5 Precautions for Use

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



01

Please make sure not to install the board with power on
And assembly peripheral operation, must be worn during installation
Anti-static tools such as static bracelets;



02

When connecting peripherals via cables, make sure
Peripheral pin definition and motherboard socket pair
Should, avoid short circuit caused by wrong wire sequence;



03

When fixing the motherboard with screws,
Uniform force to avoid board deformation caused by
PCB open circuit;



04

When installing an interface with a selectable screen voltage (than
Such as LVDS , eDP Etc.), please pay attention to the selected
The selected voltage is consistent with the screen specifications;



05

Peripheral interface type (USB, UART, IO
Etc. interface) when installing, pay attention to
Matching and current output capability issues;



06

In the backlight socket 12V Power can only be used as
Backlight power output, strictly prohibited as power input
Supply the motherboard.



07

The choice of input power depends on the total peripheral
Evaluate the input power supply voltage, total current, etc. is
Can meet the requirements;



08

When designing a complete product, the limitations of the board need to be co
High and heat dissipation issues.