

Product Specification

Mainboard series

SII-3399-A

V1.0

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Chapter 1 Introduction

1.1 Applicability

SII-3399-A is a intelligent terminal motherboard can be applied in Advertising machine, digital signage ,intelligent self-service terminal, intelligent vending machine, O2O smart equipment, industrial control computer, robot and other equipment.

1.2 Functions

SII-3399-A uses RK3399,a 64bit supper processor with dual-core Cortex-A72 and quad-core Cortex-A53,its basic frequency is 1.8GHz,SII3399 Uses Mali-T860 GPU, it has H.265 hardware decoder to supports 4K display. SII3399 integrated Dual-LVDS, EDP, HDMI display output interfaces to itself, with common backlight panel interface and screen level jumper, SII3399 is compatible to various types of display screen.With powerful performance and fast process speed, SII3399 is your best choice for human-computer interaction, intelligent terminal and industrial control projects.

1.3 Features

- Multi-display interface: dual LVDS, eDP, MIPI, HDMI and other display and output interfaces.
- Rich expansion interfaces: 7 USB interfaces(1 USB2.0 standard interface, 1 SUB3.0 OTG interface, 5 2.0 sockets), 1 485 interface, 4 expandable serial ports (2 TTL (one with hard flow control), 2 RS232), 8 GPIO and 1 ADC interfaces, which can satisfy the requirements of a variety of peripheral devices on the market.
- A variety of network interfaces: 1000M Ethernet interface, supporting 5G and 2.4GWIFI, independent dual antennas, built-in PCI-E 4G module interface, supporting Internet access and phone calls.
- High definition: it can support 4K decoding of 3840x2160 at most, LCD display screen and clipping screen with LVDS/eDP/MIPI/HDMI interfaces, and dual-screen display.
- Customize the Android system, provide the reference code of the system call interface API, and perfectly support the development of the customer's upper application APP.
- Perfect support for infrared, optical, capacitive, resistive, touch film and other mainstream touch screens, and support for HID configuration of drive-free touch screens without debugging.

Chapter 2 Product Specifications and Parameters

Type	Specification parameter
CPU	SII-3399-A Up to 64-bit high-performance CPU, 1.8 GHz; 1. dual Cortex-A72 large core+quad Cortex-A53 small core 64-bit CPU
GPU	Quad-core ARM Mali-T860MP4 high performance GPU
internal storage	4 GB as standard (2 GB optional)
Internal memory	EMMC comes standard with 32GB(8GB/16GB/64GB optional, with a maximum of 64GB).
Built-in ROM	4KB EEPROM
Decoding resolution	Maximum support 3840*2160
Operating system	Android 7.1/9.0/11/13 Linux4.4/Ubuntu18.04/Debian10
Play mode	Support multiple playback modes such as cycle, timing and interruption.
Network support	4G, Ethernet, WiFi/ Bluetooth 5.0 support, wireless peripheral expansion
video display	Support wmv, avi, flv, rm, rmvb, mpeg, ts, mp4, etc.
picture format	Supports BMP, JPEG, PNG and GIF.
Usb interface	1 USB3.0 OTG, 1 USB2.0, 5 USB2.0 sockets.
Mipi Camera	30pin FPC interface, supporting 1300W Camera.
serial port	6 serial sockets (2 RS232,1 485,2 TTL,1 DEBUG)
GPS	External GPS (optional)
WIFI、BT	Built-in WIFI,BT5.0 (optional) supports dual-band WIFI, single antenna.
3G/4G	Built-in WCDMA,EVDO,4G full net com, supporting voice calls.
Ethernet	1000M Ethernet interface
TF card	Support TF card
LVDS output	1 single/dual channel, which can directly drive 50/60Hz LCD screen.

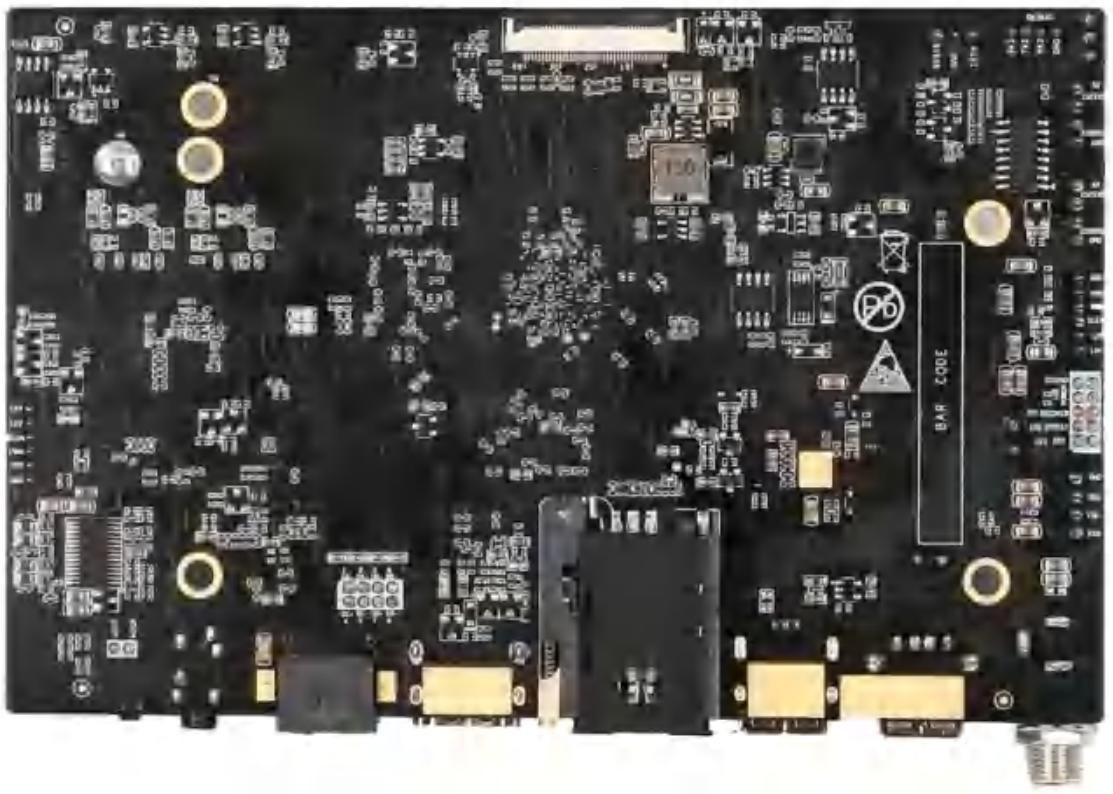
EDP output	The LCD screen with EDP interface with multiple resolutions can be directly driven.
HDMI output	1, supporting 1080P@60Hz,4kx2k@60Hz output.
Audio and video output	Support left and right channel output, built-in dual-channel 4R/10W/ each channel, 8R/5W/ each channel power amplifier.
RTC real-time clock	support
Time switch machine	support
system upgrade	Support local USB upgrade

Chapter 3 Product interface definition

【Front】



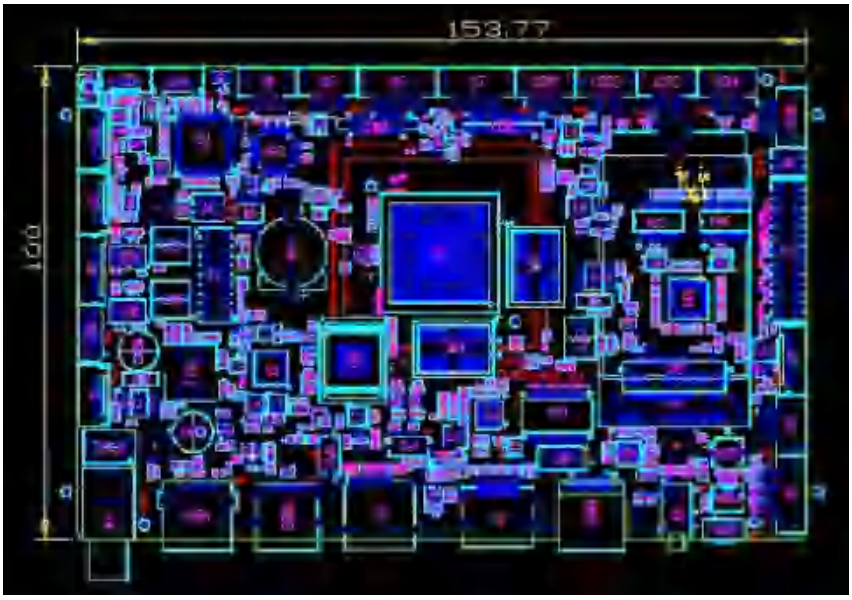
【Back】



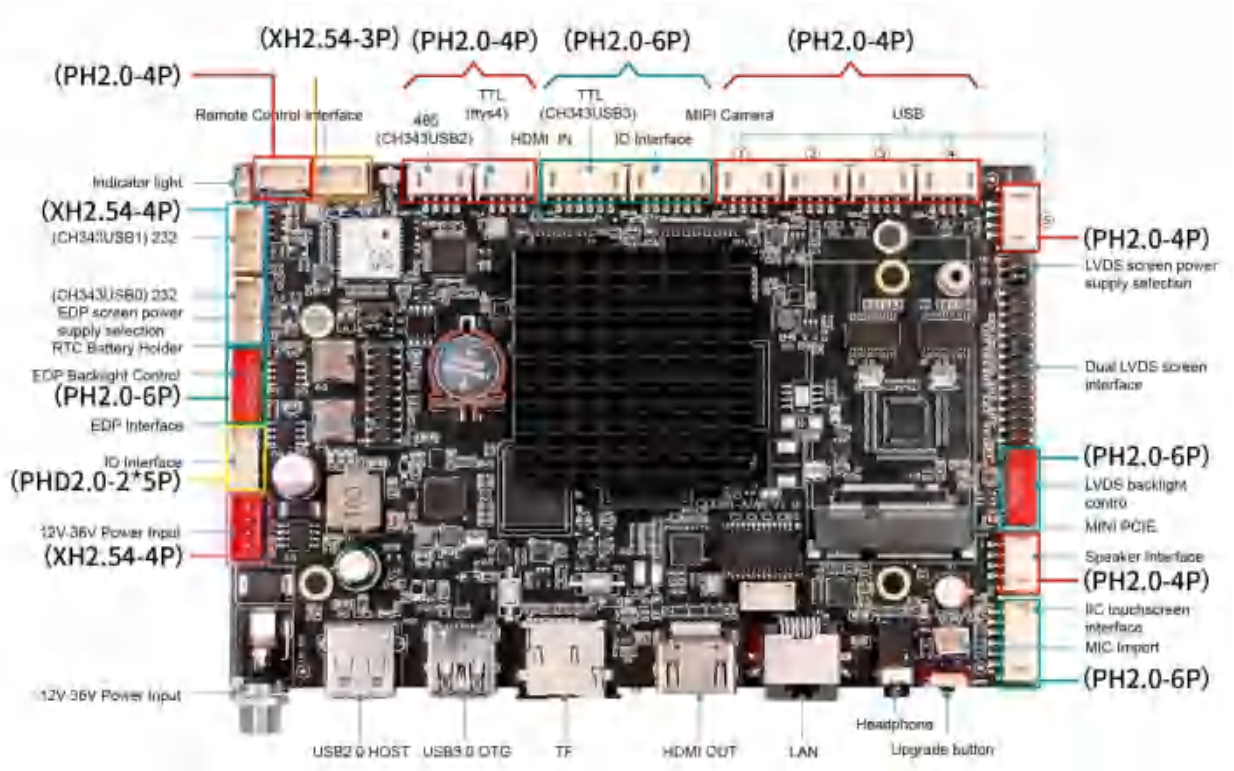
【Coastline interface】



3.1 PCB dimension drawing



3.2 Schematic diagram of external interface



◆ 3.2.1 Power input interface

The 12V-36V DC power supply is used to power the board system only from the DC block and power socket, and the plug DC IN specification of the power adapter is D5.5, d2.0 threaded head. The 12V DC power supply is required to support a minimum of 800mA current with no peripherals connected and no load.

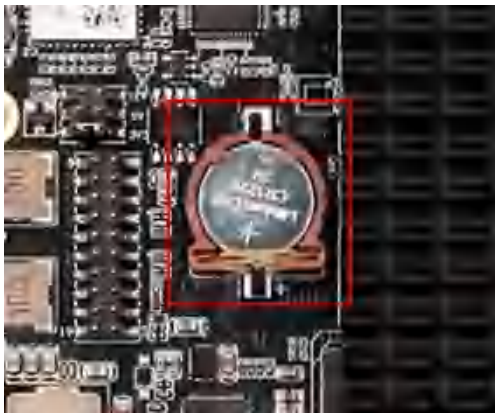


The interface of power socket is defined as follows, which can be powered by power board, and the specifications of the socket are 6PIN 2.54mm spacing.

Number	Definition	Attribute	Describe
1	VCC	input	12V-36V input
2	VCC	input	12V-36V input
3	GND	earth wire	earth wire
4	GND	earth wire	earth wire

◆ 3.2.2 RTC battery interface

Used to supply power to the system clock in case of power failure.



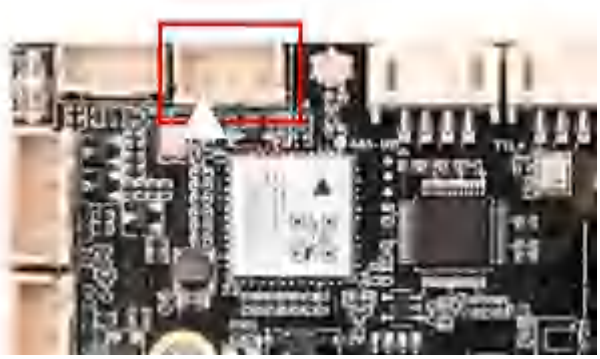
◆ 3.2.3 MIC interface

Please pay attention to the connection of the positive and negative poles of MIC, and don't connect them backwards.



Number	Definition	Attribute	Describe
1	MICN	input	MIC-
2	MICP	input	MIC+

◆ 3.2.4 Remote control receiving interface



Number	Definition	Attribute	Describe
1	IR	input	Remote control signal input
2	GND	earth wire	earth wire
3	3V3	Power Supply	3.3V output

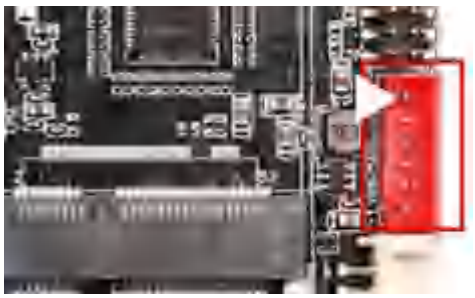
◆ 3.2.5 Work indicator light



Number	Definition	Attribute	Describe
1	LED_B	Blue light	Working indicator lamp
2	VCC	Power Supply	3.3V output
3	LED_R	red lantern	Standby indicator light

◆ 3.2.6 LVDS backlight control interface

For the backlight control of LVDS screen, the power supply current of 12V is not more than 2A. If the backlight power of the screen is more than 24W, please take power from other power boards to avoid system instability. Backlight enable voltage is 5V, if it is other voltage, please add IO level conversion circuit. This 12V power supply can only be used as backlight power supply output, and must not be used as power supply input for the system.



Number	Definition	Attribute	Describe
1	VCC	Power Supply	12V output
2	VCC	Power Supply	12V output
3	EN	output	Backlight enable control
4	PWM	output	Backlight brightness control
5	GND	earth wire	earth wire
6	GND	earth wire	earth wire

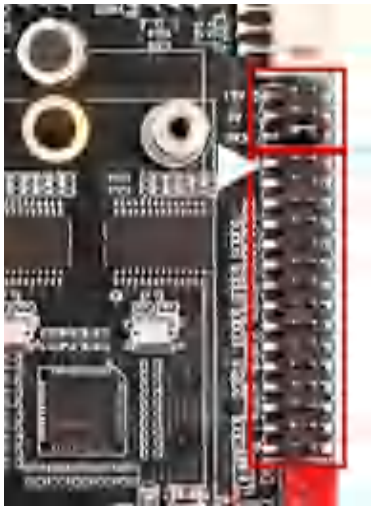
◆ 3.2.7 LVDS interface

Universal LVDS interface definition, supporting single/dual, 6/8-bit 1080P LVDS screen. The screen voltage can be selected through the jumper cap, and the power supply supporting 3.3V/5V/12V screen can be selected.

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

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

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

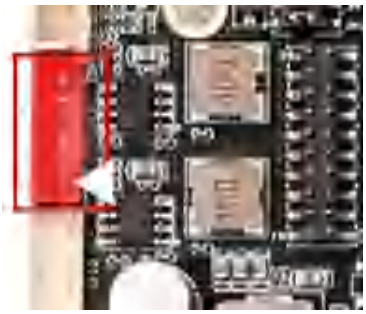


Number	Definition	Attribute	Describe
1	VCC	power output	LCD power output, +3.3V/+5V/ +12V optional.
2			
3			
4	GND	earth wire	earth wire
5			
6			
7	D0N	output	Pixel0 Negative Data (Odd)
8	D0P	output	Pixel0 Positive Data (Odd)
9	D1N	output	Pixel1 Negative Data (Odd)
10	D1P	output	Pixel1 Positive Data (Odd)
11	D2N	output	Pixel2 Negative Data (Odd)
12	D2P	output	Pixel2 Positive Data (Odd)
13	GND	earth wire	earth wire
14	GND	earth wire	earth wire
15	CLK0N	output	Negative Sampling Clock (Odd)
16	CLK0P	output	Positive Sampling Clock (Odd)
17	D3N	output	Pixel3 Negative Data (Odd)
18	D3P	output	Pixel3 Positive Data (Odd)
19	D5N	output	Pixel0 Negative Data (Even)
20	D5P	output	Pixel0 Positive Data (Even)

21	D6N	output	Pixel1 Negative Data (Even)
22	D6P	output	Pixel1 Positive Data (Even)
23	D7N	output	Pixel2 Negative Data (Even)
24	D7P	output	Pixel2 Positive Data (Even)
25	GND	earth wire	earth wire
26	GND	earth wire	earth wire
27	CLK1N	output	Negative Sampling Clock (Even)
28	CLK1P	output	Positive Sampling Clock (Even)
29	D8N	output	Pixel3 Negative Data (Even)
30	D8P	output	Pixel3 Positive Data (Even)

◆ 3.2.8 EDP backlight control interface

For backlight control of EDP screen, the power supply current of 12V is not more than 2A. If the backlight power of the screen is more than 24W, please take power from other power boards to avoid system instability. Backlight enable voltage is 5V, if it is other voltage, please add IO level conversion circuit. This 12V power supply can only be used as backlight power supply output, and must not be used as power supply input for the system.

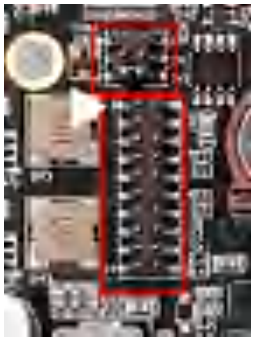


Number	Definitio	Attribute	Describe
1	VCC	Power Supply	12V output
2	VCC	Power Supply	12V output
3	EN	output	Backlight enable control
4	PWM	output	Backlight brightness control
5	GND	earth wire	earth wire
6	GND	earth wire	earth wire

◆ 3.2.9 EDP interface

In the above picture, the jumper cap is used to select the screen power supply, which can be selected as 12V/5V/3.3V. Please refer to the screen printing on the back of PCB carefully.

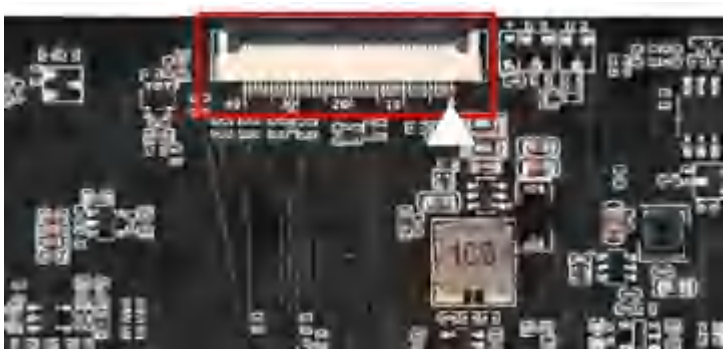
For the electrical definition of the output interface, pay attention to the position of the first pin of the 20PIN plug-in. If it is inserted backwards, it is easy to burn the EDP screen.



Number	Definitio	Attribute	Describe
1	VCC	power output	LCD power output, +3.3V/+5V/ +12V optional.
2			
3	GND	earth wire	earth wire
4			
5	TX0P	output	EDP Pixel0 Positive Data (Odd)
6	TX0N	output	EDP Pixel0 Negative Data (Odd)
7	TX1P	output	EDP Pixel1 Positive Data (Odd)
8	TX1N	output	EDP Pixel1 Negative Data (Odd)
9	TX2P	output	EDP Pixel2 Positive Data (Odd)
10	TX2N	output	EDP Pixel2 Negative Data (Odd)
11	TX3P	output	EDP Pixel3 Positive Data (Odd)
12	TX3N	output	EDP Pixel3 Negative Data (Odd)
13	GND	earth wire	earth wire
14	GND	earth wire	earth wire
15	AUXP	output	EDP AUX Positive Data (Odd)
16	AUXN	output	EDP AUX Negative Data (Odd)
17	GND	earth wire	earth wire
18			
19			
20	HPD	input	EDP DETECT

◆ 3.2.10 MIPI interface

MIPI interface supports single-channel MIPI LCD screen, and 4-channel MIPI interface supports up to 1920*1200@60fps.



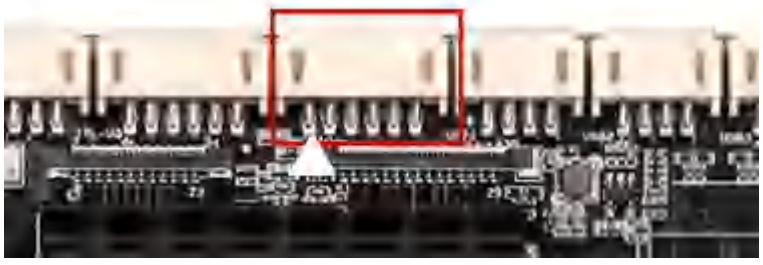
Number	Definition	Attribute	Describe
40	NC	-	Not connect
39	VDD	Power Supply	Digital power
38	VDD	Power Supply	Digital power
37	GND	land	Ground
36	REST	output	Global reset pin
35	NC	-	Not connect
34	GND	land	Ground
33	D0N	output	Negative MIPI differential data output
32	D0P	output	Positive MIPI differential data output
31	GND	land	Ground
30	D1N	output	Negative MIPI differential data output
29	D1P	output	Positive MIPI differential data output
28	GND	land	Ground
27	CLKN	output	Negative MIPI differential data output
26	CLKP	output	Positive MIPI differential data output
25	GND	land	Ground
24	D2N	output	Negative MIPI differential data output
23	D2P	output	Positive MIPI differential data output
22	GND	land	Ground
21	D3N	output	Negative MIPI differential data output
20	D3P	output	Positive MIPI differential data output
19	GND	land	Ground

18	NC	-	Not connect
14	NC	-	Not connect
16	GND	land	Ground
15	NC	-	Not connect
14	NC	-	Not connect
13	NC	-	Not connect
12	NC	-	Not connect
11	GND	land	Ground
10	LED-	Power Supply	LED Cathode
9	LED-	Power Supply	LED Cathode
8	NC	-	Not connect
7	NC	-	Not connect
6	NC	-	Not connect
5	NC	-	Not connect
4	NC	-	Not connect
3	NC	-	Not connect
2	LED+	Power Supply	LED Anode
1	LED+	Power Supply	LED Anode

◆ 3.2.11 IO interface

IO is used to provide input/output of control signals for peripherals, and the level is 3.3V ADC signals can be used for key control. The switch key is also led out of the socket.





Number	Definition	Attribute	Describe
1	VCC	Power Supply	3.3V output
2	RST_L	output	Reset 0
3	I/O0	Input / output	IO0
4	OTP	Input	Reset 1
5	I/O1	Input / output	IO1
6	ADC	input	ADC signal
7	I/O2	Input / output	IO2
8	PWR_K	input	System on-off
9	I/O3	Input / output	IO3
10	GND	earth wire	earth wire

Number	Definition	Attribute	Describe
6	VCC	Power Supply	3.3V output
5	IO5	Input / output	IO4 port
4	IO6	Input / output	IO5 port
3	IO7	Input / output	IO6 port
2	IO8	Input / output	IO7 kou
1	GND	earth wire	earth wire

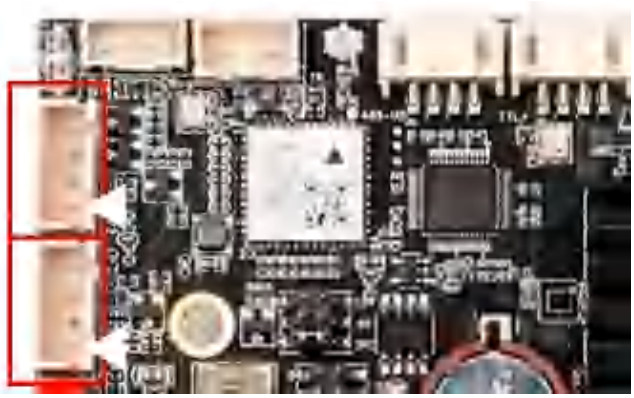
◆ 3.2.12 232 serial port socket *2

The board leads out two groups of ordinary 232 serial ports, which can support the common 232 serial port devices in the market.

Precautions:

1. Whether the serial port voltage matches. Can not directly access the general 232 serial port equipment in the market.

2. Is the TX and RX connection correct, The following two RS232 groups are mapped as CH343USB1, CH343USB0 respectively.



Number	Definition	Attribute	Describe
1	GND	earth wire	earth wire
2	PC-RX	input	232-RX
3	PC-TX	output	232-TX
4	VCC	Power Supply	5V output

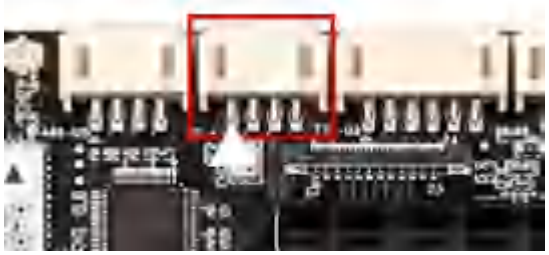
◆ 3.2.13 TTL serial port socket interface *2

The board leads out two groups of ordinary two-wire serial ports, which can support common serial port devices in the market, and the level of serial ports is 0V to 3.3V. If the level of the connected serial port is higher than 3.3V, there should be an isolation circuit or a level conversion circuit, otherwise the main control and equipment will be burned out.

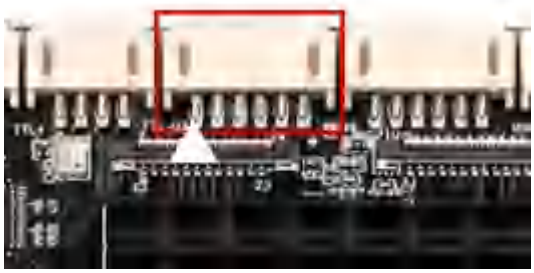
Precautions:

1. Whether the TTL serial port voltage matches. Can't directly access the max 232,485 device.

2. Whether the TX and RX connections are correct.



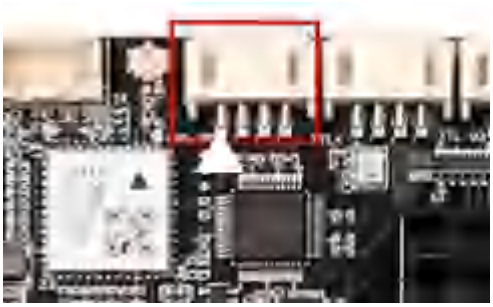
Number	Definition	Attribute	Describe
1	GND	earth wire	earth wire
2	UART-RX	input	RX
3	UART-TX	output	TX
4	VCC	Power Supply	3.3V output



This TTL group is mapped to CH343USB3.

Number	Definition	Attribute	Describe
1	RTX	Handshake signal	Request data transmission
2	CTX	Handshake signal	Request data reception
3	GND	earth wire	earth wire
4	UART-RX	input	RX
5	UART-TX	output	TX
6	VCC	Power Supply	3.3V output

◆ 3.2.14 485 interface



The board also supports a set of 485 communication interfaces and common 485 interface devices on the market, and the level of the interfaces is 3.3V. If the level of the docking interface is higher than 3.3V, there should be an isolation circuit or a level conversion circuit, otherwise the main control and equipment will be burned out.

Precautions:

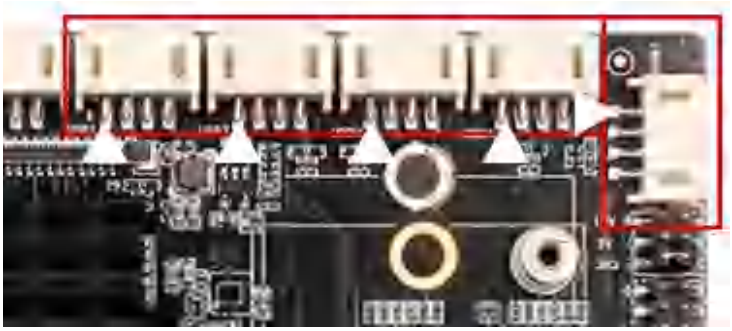
1. Whether the 485 interface voltage matches.

2, 485A,485B line sequence connection is correct.

Number	Definition	Attribute	Describe
1	GND	earth wire	earth wire
2	485B	Input/output	RX
3	485A	Input/output	TX
4	VCC	Power Supply	5V output

◆ 3.2.15 USB interface

The board has three USB standard interfaces and five built-in USB sockets, which are used for peripheral expansion. The default is HOST, and the power supply current is not more than 500mA.

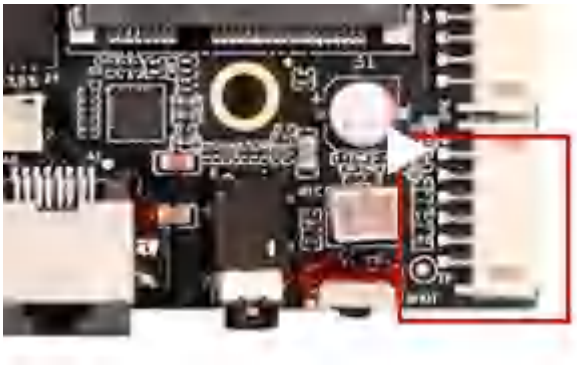


Number	Definition	Attribute	Describe
4	VCC	Power Supply	5V output
3	DM	Input/output	DM
2	DP	Input/output	DP
1	GND	earth wire	earth wire

The board has a standard OTG3.0 interface, a standard USB2.0 HOST interface

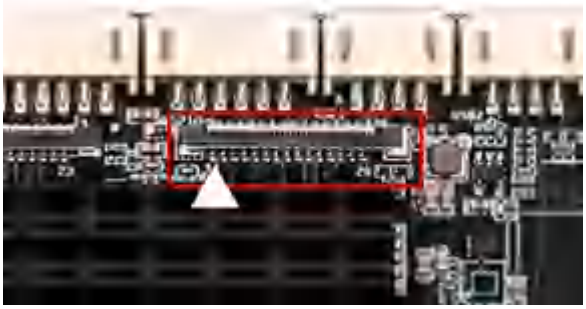


◆ 3.2.16 Touch screen interface



Number	Definition	Attribute	Describe
1	VCC	Power Supply	3.3V output
2	SCK	Input/output	I2C clock
3	SDA	Input/output	I2C data
4	INT	Input/output	suspend
5	RST	Input/output	reset
6	GND	earth wire	earth wire

◆ 3.2.17 Camera_IN interface

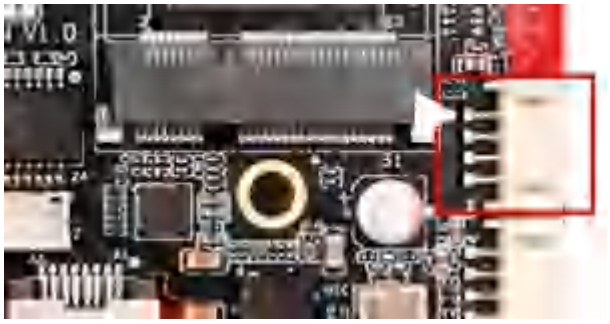


The board can support a MIPI camera with a maximum pixel of 1300W W. The electrical definition of the socket is as follows:

Number	Definition	Attribute	Describe
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	earth wire	earth wire
7	VDD	Power Supply	2.8V output
8	GND	earth wire	earth wire
9	I2C3_SDA	Input/output	SDA signal
10	I2C3_SCL	output	SCL signal
11	RST	output	reset signal
12	PWDN	output	Power failure control
13	GND	earth wire	earth wire
14	MCLK	output	master clock
15	GND	earth wire	earth wire
16	D3P	Input/output	MIPI data channel 3 is positive
17	D3N	Input/output	MIPI data channel 3 negative
18	GND	earth wire	earth wire
19	D2P	Input/output	MIPI data channel 2 is positive
20	D2N	Input/output	MIPI data channel 2 negative

21	GND	earth wire	earth wire
22	D1P	Input/output	MIPI data channel 1 is positive
23	D1N	Input/output	MIPI data channel 1 negative
24	GND	earth wire	earth wire
25	CLKP	Input/output	MIPI clock channel positive
26	CLKN	Input/output	MIPI clock channel negative
27	GND	earth wire	earth wire
28	D0P	Input/output	MIPI data channel 0 is positive
29	D0N	Input/output	MIPI data channel 0 negative
30	GND	earth wire	earth wire

◆ 3.2.18 Horn interface



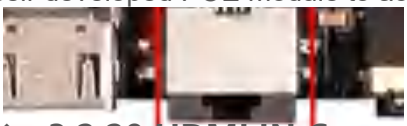
Number	Definition	Attribute	Describe
1	OUP-L	output	Audio output left+
2	OUN-L	output	Audio output left-
3	OUN-R	output	Audio output right-
4	OUP-R	output	Audio output right+

◆ 3.2.19 Ethernet

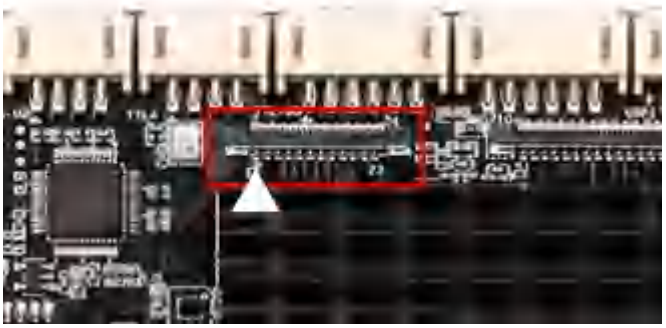
Number	Definition	Attribute	Describe
1	DA+	RJ45signal	DA+signal
2	DC+	RJ45signal	DC+signal
3	DA-	RJ45signal	DA-signal
4	DC-	RJ45signal	DC-signal
5	DB+	RJ45signal	DB+signal
6	DD+	RJ45signal	DD+signal
7	DB-	RJ45signal	DB-signal
8	DD-	RJ45signal	DD-signal



The board supports up to Gigabit Ethernet ports, and reserved a standard RJ45 interface and dual-row 2.0 pitch 8PIN, but only one of the two can be selected to use. 8PIN interface can be used with our self-developed POE module to achieve POE function.



◆ 3.2.20 HDMI IN Connector



Number	Definition	Attribute	Describe
1	VCC	power supply	5V output
2	PWREN	output	power supply enable
3	GND	earth (wire)	earth (wire)
4	GND	earth (wire)	earth (wire)
5	D0N	Input/output	MIPI data channel 0 negative
6	D0P	Input/output	MIPI data channel 0 is positive
7	D1N	Input/output	MIPI data channel 1 negative
8	D1P	Input/output	MIPI data channel 1is positive
9	D2N	Input/output	MIPI data channel 2 negative
10	D2P	Input/output	MIPI data channel 2 is positive
11	D3N	Input/output	MIPI data channel 3 negative
12	D3P	Input/output	MIPI data channel 3 is positive
13	CLKN	Input/output	MIPI clock channel negative
14	CLKP	Input/output	MIPI clock channel positive
15	INT	Input	interrupt signal
16	STBY	output	Standby control
17	IR	Input	Standby
18	RST	output	reset signal
19	I2S_LRCK_RX	Input/output	I2S in-group signals
20	I2S_SCLK	Input/output	I2S in-group signals
21	I2S_MCLK	output	I2S in-group signals
22	I2S_SDI	Input	I2S in-group signals
23	I2C4_SDA	Input/output	SDA signal
24	I2C4_SCL	output	SCL signal

- Button Description



CPU burn-in button is pressed before powering up to enter burn-in mode.

◆ 3.2.21 Other standard interfaces and functions

Memory interface	TF card	Data storage, supporting 1T at most.
	USB	HOST interface, supporting data storage, data import, USB mouse and keyboard, camera, touch screen, etc.
Ethernet interface	RJ45 interface	Support two 1000M/100M wired networks.
HDMI interface	standard interface	Support HDMI data output, with maximum support of 1080P.
headphone jack	standard interface	3.5mm standard interface
4G interface	PCI-E standard interface	Support Huawei, ZTE and other Mini PCI-E 4G modules.
SIM card interface	standard interface	Support various standards (depending on 3G module)

Chapter 4 Electrical Performance of Products

project		minimum	typical	maximum
Power supply parameters	voltage	--	12V	36V
	ripple	--	--	100mV
	electric current			
Power supply current (HDMI output, no other peripherals connected)	operational current	--	350mA	800mA
	Standby current	--		
	USB supply current	--	--	500mA
Supply current (LVDS)	3.3V working current			
	5V working current			
	12V working current			
	USB supply current	--	--	
Power supply current (eDP)	3.3V working current			
	5V working current	--		
	12V working current	--		
	USB supply current	--	--	
static electricity	Contact discharge			4KV
	Air discharge			8KV
environment	relative humidity	--	--	80%
	Working temperature	-20℃	--	70℃
	Storage temperature	-30℃		80℃

Note 1: When connecting the LVDS screen, you should pay attention to choosing the correct backlight

working voltage of 3.3V,5V,12V and 12V, and users should not apply it to peripherals that exceed the corresponding maximum current.

Note 2: When the eDP/LVDS screen is connected, the working current and standby current of the whole board depend on the connected screen, which are not listed in the above table.

Chapter 5 Matters needing attention in assembly and use

During assembly and use, please pay attention to the following (but not limited to) problems.

1. Short circuit between bare board and peripheral;

2. In the process of installation and fixation, the problem of deformation of bare board caused by fixation is avoided;

3. When installing eDP/LVDS screen, pay attention to whether the screen voltage and current are consistent, and pay attention to the direction of the 1-pin of the screen seat;

4. When installing eDP/LVDS screen, pay attention to whether the screen backlight voltage and current meet. If the backlight power of the screen is above 20W, whether to use other power boards for power supply;

5. When installing peripherals (USB, IO, ETC), pay attention to the IO level and current output of peripherals;

6. When installing the serial port, pay attention to whether the 232,485 devices are directly connected. Whether TX and RX are connected correctly.

7. Whether the input power supply is involved in the power supply input interface, and whether the input power supply voltage and current meet the requirements according to the overall peripheral evaluation. Put an end to the input power supply that is connected from the backlight socket for convenient operation.