必読

デジタルサイネージ集客クン

Android　STB
Digital signage
Specification

OF system
Corporation

Chapter 1. Production General Description

1.1 IoT-3399E Scope of Application

IoT-3399E belongs to android smart motherboard, generally applicable to smart display terminal products, video terminal product, Industrial automation terminal products, such as advertising machines, digital sign boards, intelligent self-help terminals, intelligent retail terminals, O2O intelligent devices, industrial control hosts, robot devices, etc.

1.2 General Description

Iot-3399e with rockchip rk3399 (Dual Cortex-A72 big core+quad Cortex-A53 small core) Six core 64 super CPU, Equipped with android7.1 system, clocked up to 2 GHz. Using mali-t860mp4 GPU, support 4K, h.265 hard decoding. Multi channel video input and output, better performance, faster and richer interface, is you in human-computer interaction, intelligent terminal, the best choice for industrial projects.

1.3 Features

Rk3399 super CPU equipped with Android 7.1 system, faster, more powerful.

Support 5g and 2.4gwifi, independent double antenna.

Port design, support 1000M network port.

The built-in PCI-E 3g/4g module interface. Support for HUAWEI, ZTE, dragon is PCI-E and other 3g/4g module, support the Internet and talk.

The extended interface. 8 USB interface rich (1 USB3.0 OTG, 1 USB host , 1USB2.0, 5 hub), 1pc 485, 4 extended serial interface (1 TTL, 3 RS232), GPIO and ADC interface, can satisfy the market requirements of various peripheral.

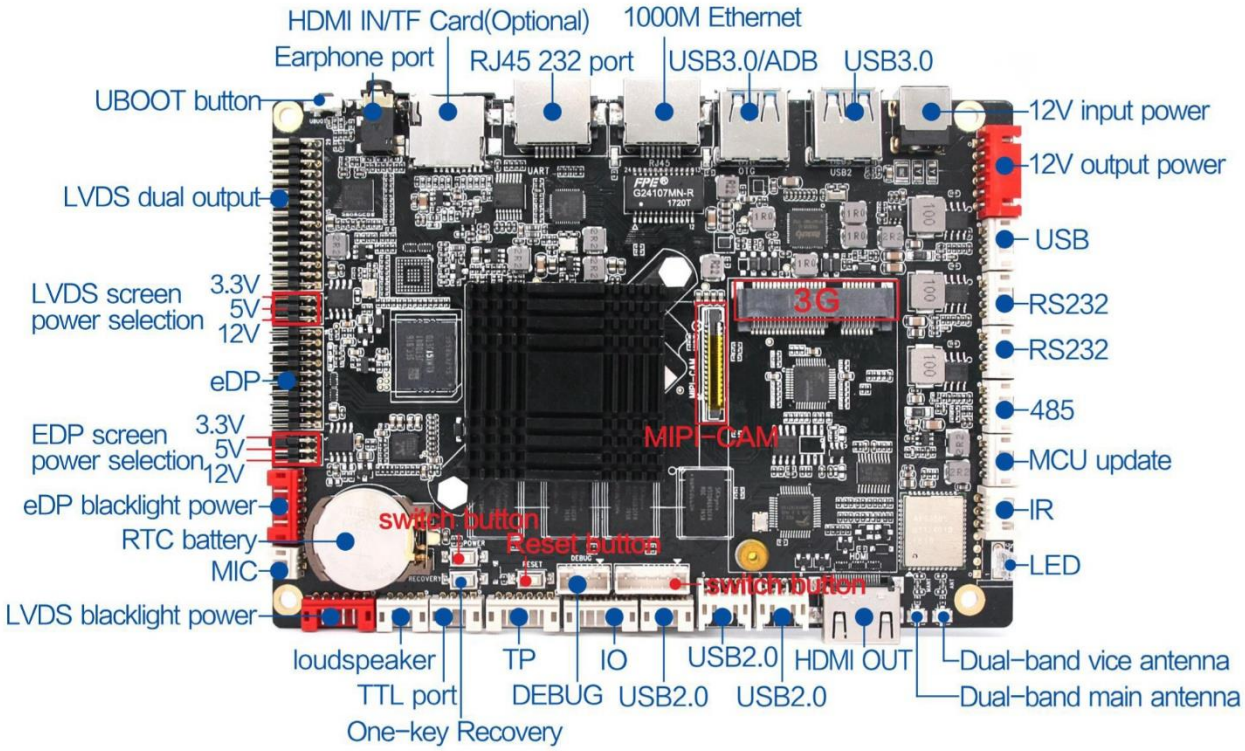
High definition decoding. 4K maximum support 3840x2160, LCD display, support lvds/edp/hdmi out/hdmi in interface to support dual screen clipping, significantly different

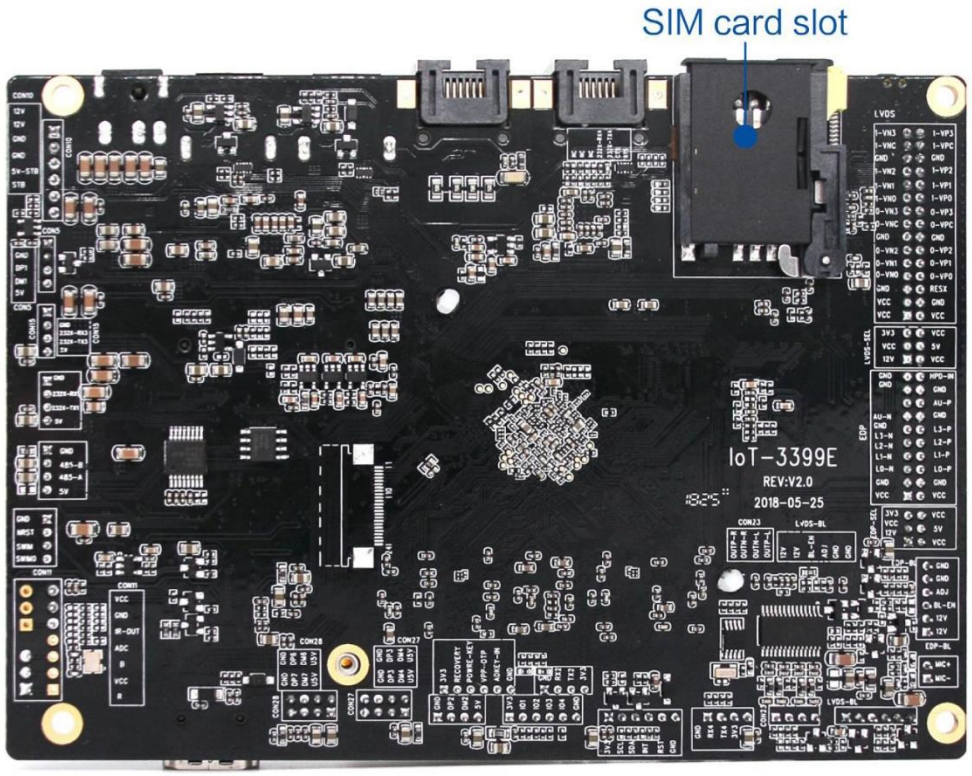
Support Android system customization, provide system call interface, API reference code, perfect support for customer upper application app development.

Perfect support for infrared, optical, capacitive, resistance, touch film and other mainstream touch screen, support free drive touch screen hid configuration, without debugging

1.4 Appearance and Interface Sketch

Front/Back





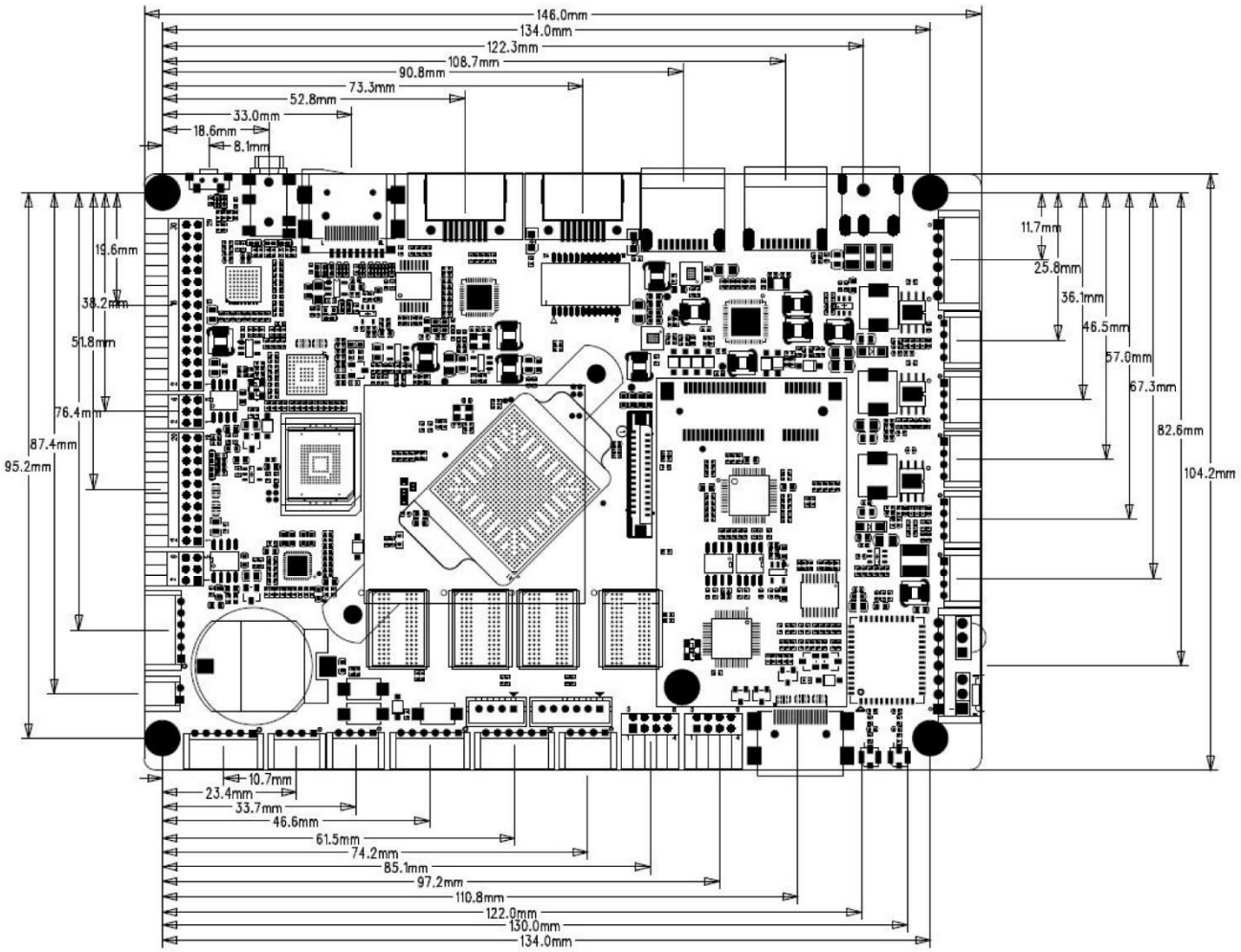
Chapter 2. Basic Function List

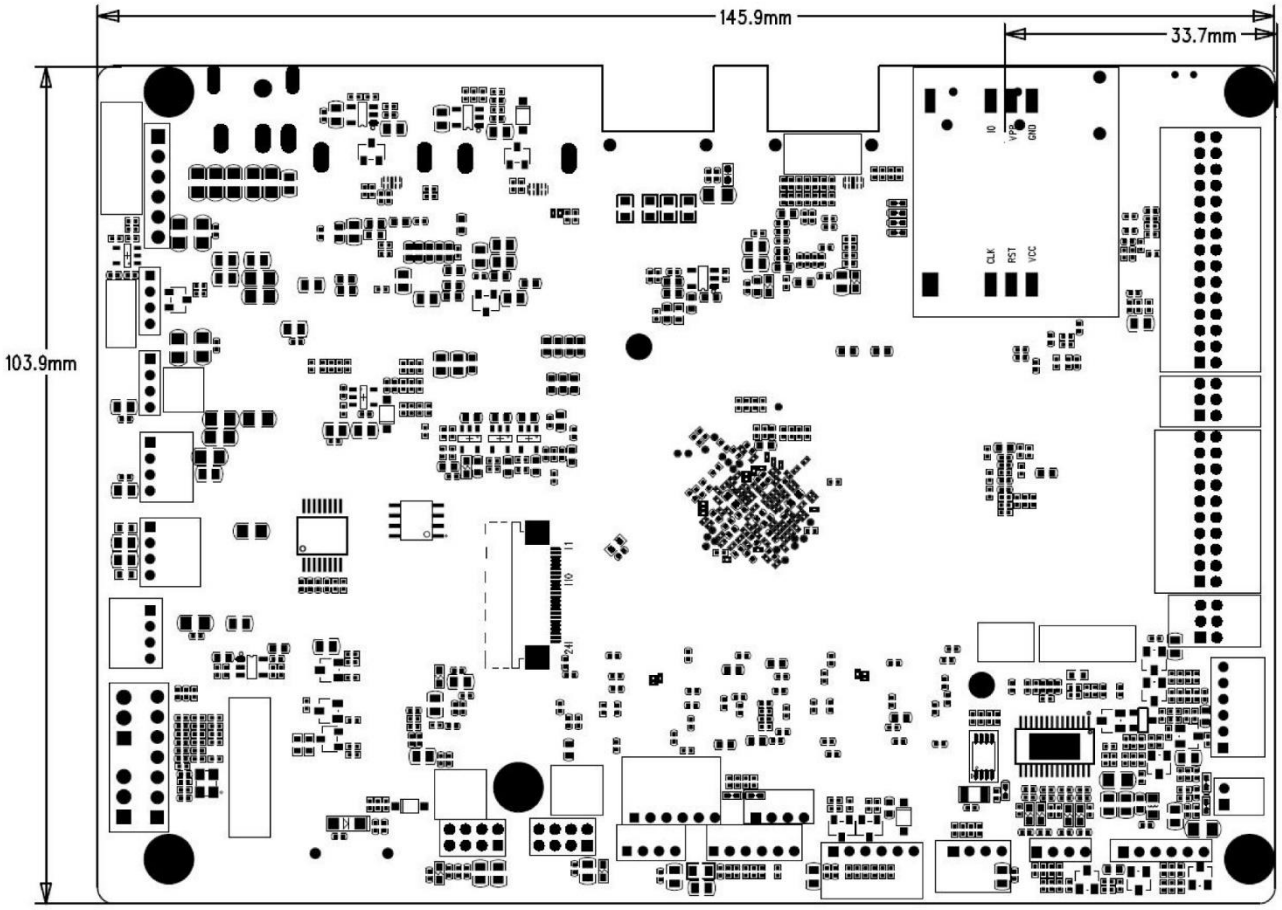
Main Hardware Index	
CPU	Rockchip RK3399 The highest 64 bit high performance CPU，2.0GHz； 1. Dual Cortex-A72 big core+quad Cortex-A53 small core 64-bit CPU 2. Built in low power MCU Cortex-M0
GPU	Quad core Arm mali-T860Mp4 high performance GPU
Memory / Storage	2G（4G optional)/ EMMC 16G（8G/32G/64G optional）
Built-in Memory	32KB EEPROM
LVDS output	1 single / double path, can directly drive 1920x1080 LCD screen
Edp output	Edp Interface LCD with maximum Drive 4kx2k Resolution
HDMI output	One, support 1080P@60Hz，4kx2k@60Hz output
HDMI in	Optional, standard board default not have HDMI in, support 1080p@60hz (Tf card 2 option 1)
Audio And Video Output	Support right and left channel output, built-in double 4r/20w, 8r/10w power amplifier

Earphone	Support for one-way headphone interface
USB interface	2 usb3.0, 1 usb2.0 host socket, 5 usb socket
serial port	3pcs RS232, 1PC 485,1PC TTL, 1PC DEBUG
Mipi Camera	30pin FPC interface，support 1300w Camera
TF card	optional，chose one with HDMI IN，Standard board default TF card
WIFI、BT	2.4+5G Dual frequency wifi dual antenna，BT4.0
3G/4G	Built-in 3G/4G PCI-E interface to support Internet and voice calls
Ethernet	One，self-adaption 100M/1000M Ethernet
Video Playing	Support wmv、avi、flv、rm、rmvb、mpeg 、ts、mp4,etc
Picture format	Support BMP、JPEG、PNG、GIF
operating system (OS)	Android 7.1
RTC real-time clock	Support
Timing switch	Support
system upgrade	Support local USB upgrade

Chapter 3.PCB Measurement And Interface Layout

3.1 PCB Measurement Chart





PCB：8 players

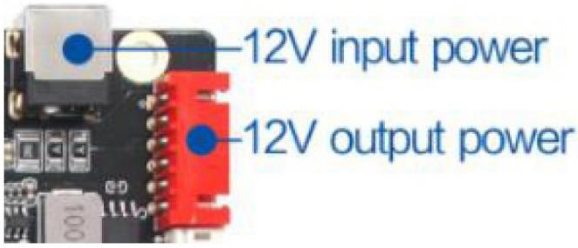
Measurement：146mm*104mm, thickness 1.6mm

Screw hole specification：ϕ3.2mm x 4

3.2 Interface Parameter Definition

◆Power Input Port

Using 12V DC power supply, only allowed from the DC block and the power socket to board power supply system, power adapter plug DC in specifications for d6.0, d2.0. in the empty load case missed peripherals, 12V DC power supply to support a minimum of 600mA current.

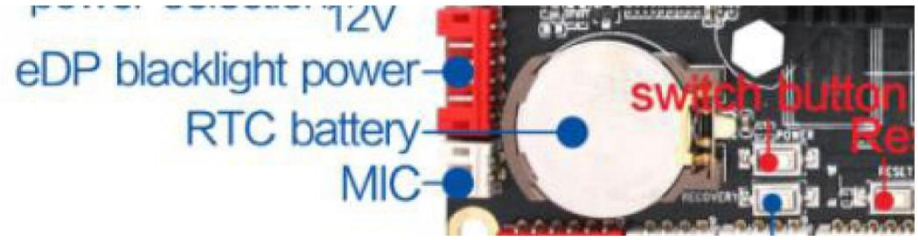


The power socket interface is defined as follows: power board is used to supply power, and the sub standard is 4Pin 2.54mm spacing

NO.	Definition	Property	Description
1	VCC	input	12V input
2	VCC	input	12V input
3	GND	ground electrode	ground electrode
4	GND	ground electrode	ground electrode
5	5V-STB	input	5V input
6	STB	Input output	Drop down to connect to the MCU pin PA3

- **BAT1 RTC Battery Port**

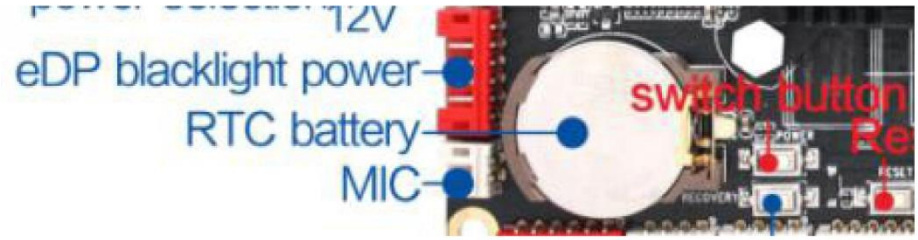
Used to power the system clock when power is off .



NO.	Definition	Property	Description
1	RTC	input	3V input
2	GND	ground electrode	ground electrode

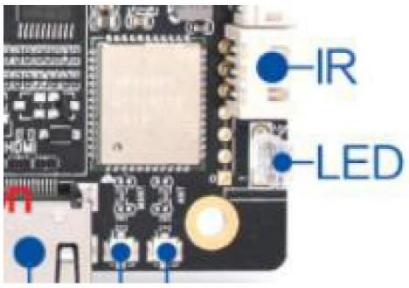
- **MIC Port**

Please note that the MIC is positive negative connection，not reverse.



NO.	Definition	Property	Description
1	MIC-	input	MIC-
2	MIC+	input	MIC+

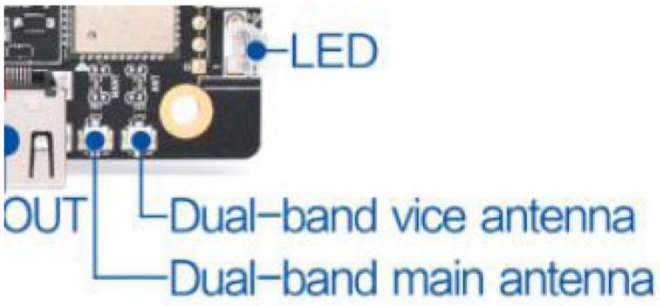
- **Port Of Receiving Remote Control**



NO.	Definition	Property	Description
1	IR	Input	Remote
2	GND	ground electrode	ground electrode
3	3V3	Power supply	3.3V output

- **Work Indicating Lamps**

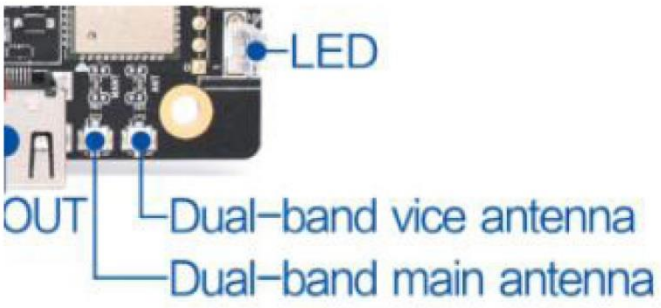
The default support Yang red blue LED lamp.



NO.	Definition	Property	Description
1	LED_R	Red light	Standby lamp
2	VCC	Power supply	3.3V output
3	LED_B	Blue light	Work light

- **LED/IR Port**

The position is shared with the remote control receiver and indicator light (can choose welding 2.54 mm spacing of 7 pins socket) .



NO.	Definition	Property	Description
1	LED_R	output	standby indicating lamp
2	VCC	power	3.3V output
3	LED_B	output	work indicating lamp
4	ADC	ADC input	ADC button input
5	IR	input	remote control signal input
6	GND	ground electrode	ground electrode
7	3.3V	power	3.3V output

- **Backlight Control Port**

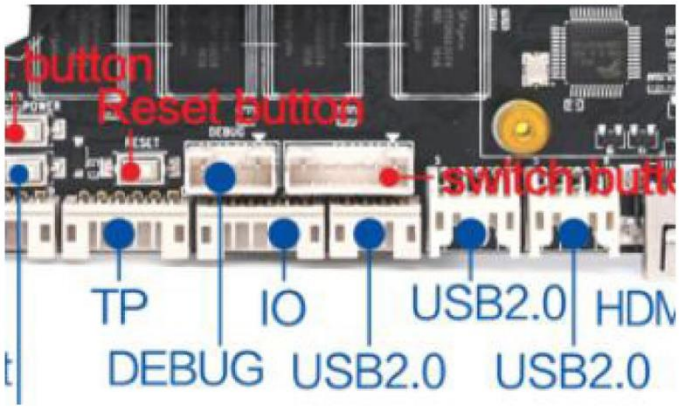
For the backlight control LVDS screen, 12V supply current is less than 1.5A, when the power to use the 19 inch or bigger size screen or screen backlight is more than 20W words, please take power from the other backlight power supply board, so as to avoid the instability of the system. The backlight enable voltage is 5V, such as the other voltage, please add IO level conversion circuit. The 12V power can only be used as a backlight power output, and can not as input power supply system.

NO.	Definition	Property	Description
6	VCC	Power	12V output
5	VCC	Power	12V output
4	BL-EN	output	backlight enable control
3	BL-ADJ	output	backlight brightness adjust control
2	GND	ground electrode	ground electrode
1	GND	ground electrode	ground electrode

- **IO/KEY Port**

IO input / output used to provide the control signal to the peripheral device. The level is 3.3V, and the ADC signal can be used as the key control.

The socket also leads to a switch button and upgrade button interface



NO.	Definition	Property	Description
1	VCC	power	3.3V output
2	I/O	output/input	GPIO-1 (drop-down 2.2K)
3	I/O	output/input	GPIO-2 (drop-down 2.2K)
4	I/O	output/input	GPIO-3
5	I/O	output/input	GPIO-4
6	GND	ground electrode	Power ground

- **LVDS Port**

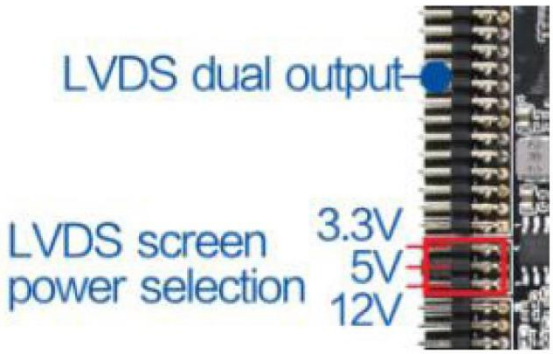
Universal LVDS interface definition, support single / double, 6/8/ bit 1080P LVDS screen. Screen voltage can be selected by jumper cap, you can choose to support

3.3V/5V/12V screen power supply

In order to avoid burning boards and screens, please note the following:

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

2.Please use the multimeter to confirm whether the jumper cap is correct



The jumper cap is used to select the screen power, from top to bottom, followed by 3.3V/5V/12V

NO.	Definition	Property	Description
1	PVCC	power output	LCD power output， +3.3v/+5V/ +12V optional
2			
3			
4	GND	ground electrode	ground electrode
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	ground electrode	ground electrode
14	GND	ground electrode	ground electrode
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	ground electrode	ground electrode
26	GND	ground electrode	ground electrode
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)

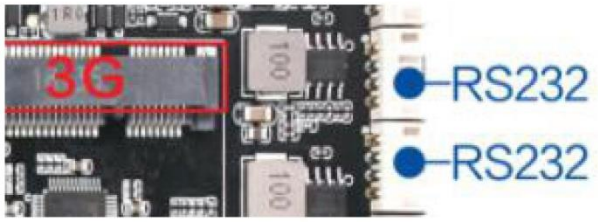
232 Serial socket interface*2

The board raises the 2 group of ordinary 232 serial port can support the market 232 universal serial device

Remark:

1.Serial voltage matching, Cannot access directly TTL,485 serial device.

2.TX，RX　whether the connection is correct.



NO.	Definition	Property	Description
1	GND	ground electrode	ground electrode
2	232-RXn	Input	232-RX
3	232-TXn	Output	232-TX
4	VCC	Power	5V Output

- **TTL Serial socket interface*1**

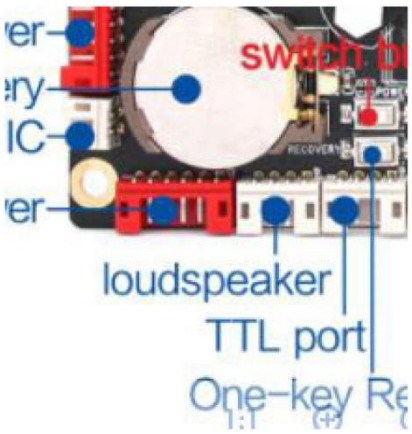
The board leads to 2 groups of common double line serial port, can support the general market of serial device, serial port level from 0V to 3.3V.

If the level of the serial port is higher than 3.3V, there must be isolated circuit or level conversion circuit, otherwise it will burn out the main control and equipment

Remark:

1.Serial voltage matching, Cannot access directly MAX232,485 serial device.

2.TX，RX　whether the connection is correct.



Serial　4（USB transmit TTL）definition:

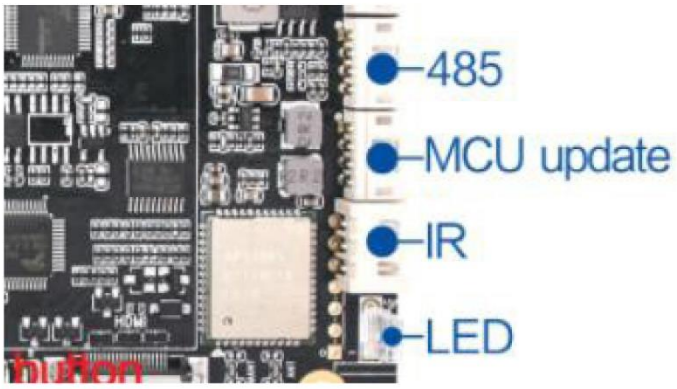
NO.	Definition	Property	Description
1	GND	ground electrode	ground electrode
2	UART-RX	Input/output	RX
3	UART-TX	Input/output	TX
4	VCC	power	3.3V output

- **485**

The board also supports 1 sets of 485 communication interface, can support the general market of 485 interface equipment, the interface level is 3.3V. If the level of the docking interface is higher than 3.3V, an isolated circuit or level conversion circuit is necessary, otherwise the main control and equipment will be burned out

1. 485 Serial port voltage matching

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

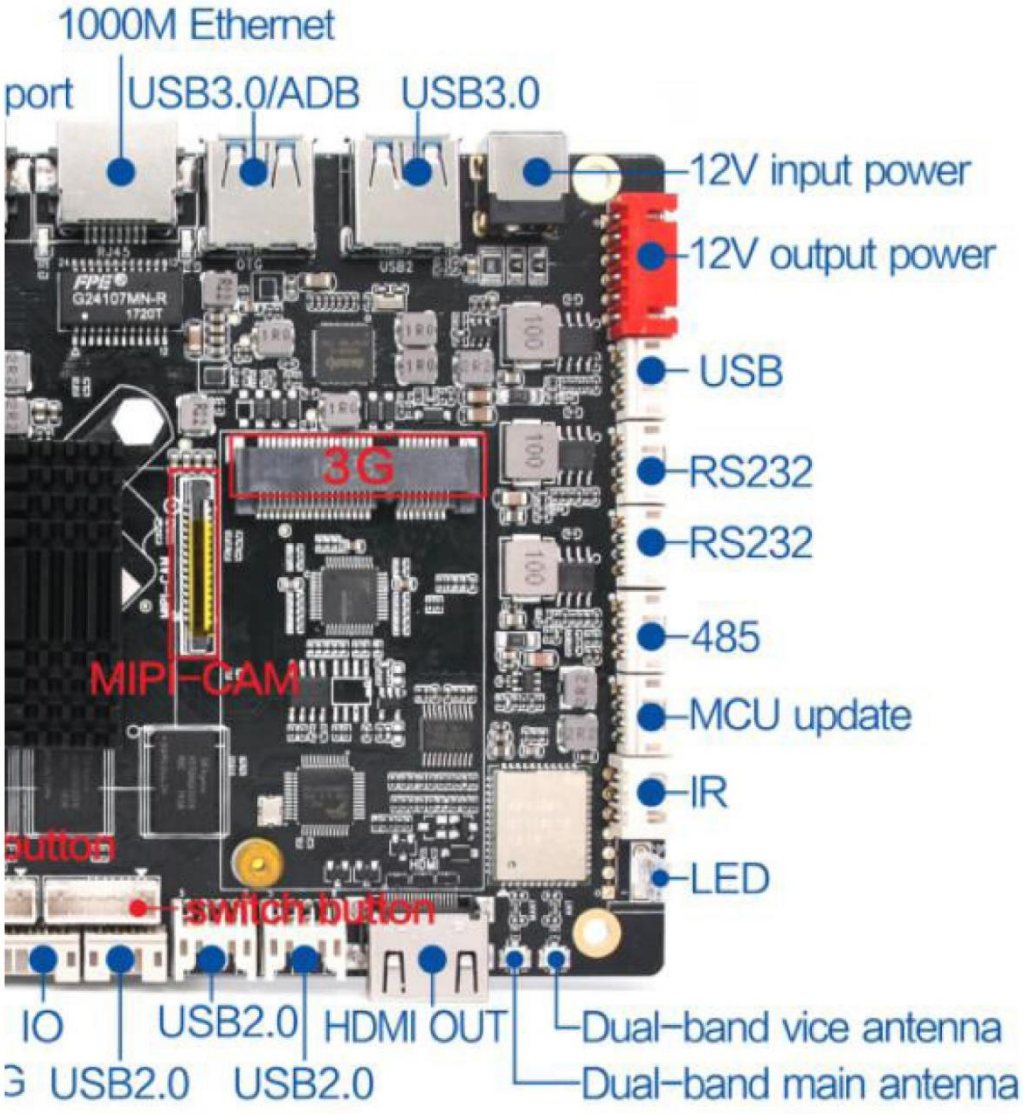


485 interface definition:

NO.	Definition	Property	Description
1	GND	ground electrode	ground electrode
2	485B	input/output	RX
3	485A	input/output	TX
4	VCC	power	3.3V output

- **USB**

The board has 2 USB standard interface, USB3.0 / ADB for burning debugging requires setting host and device modes in the accessibility options in the system settings，6 built-in usb sockets，For peripheral extensions, default to host ，the current supply is not greater than 500mA.



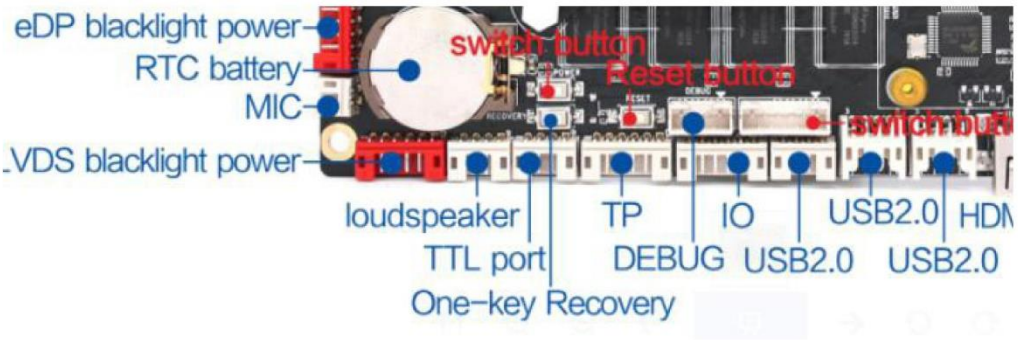
Single row USB electrical socket, defined as follows:

NO.	Definition	Property	Description
1	GND	ground electrode	ground electrode
2	DM	input/output	DM
3	DP	input/output	DP
4	VCC	power	5V output

Double line USB socket, electrical definition is as follows:

NO.	Definition	Property	Description
1	VCC	power	5V output
2	DM	input/output	DM
3	DP	input/output	DP
4	GND	ground electrode	ground electrode
5	VCC	power	5V output
6	DM	input/output	DM
7	DP	input/output	DP
8	GND	ground electrode	ground electrode

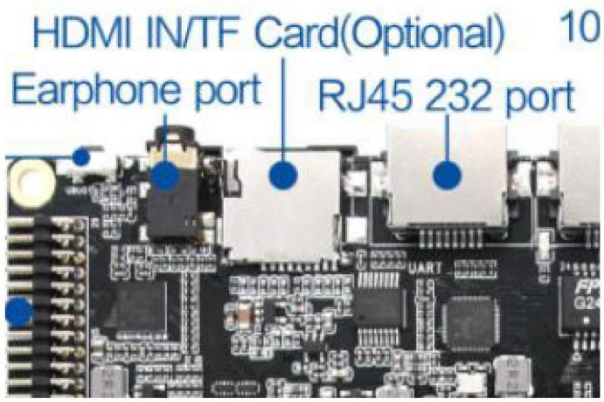
- **The touch screen interface**



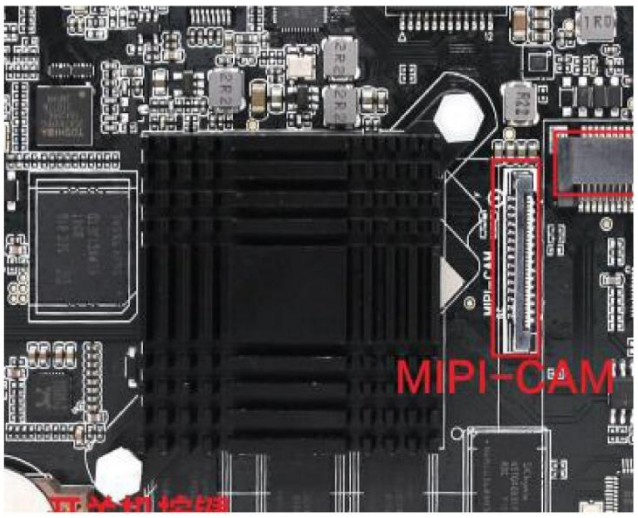
NO.	Definition	Property	Description
1	VCC	power	3.3V output
2	SCl	input/output	I2C clock
3	SDA	input/output	I2C data
4	INT	input/output	interrupt
5	RST	input/output	reset
6	GND	ground electrode	ground electrode

- **HDMI_IN Interface**

This interface is optional, only can choose one interface from HDMI_in interface or TF card.



- **Camera_IN Interface**

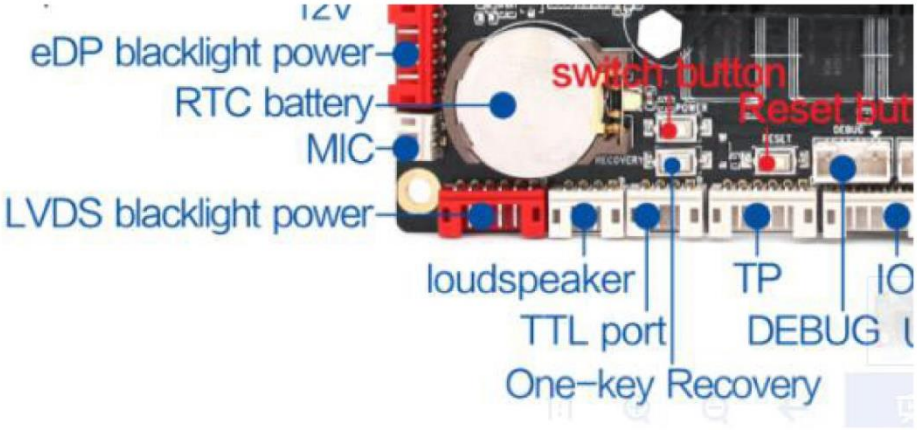


The card maximum supports a 1400w pixel mipi camera, installed in the jp26 socket, the electrical definition of which is as follows

NO.	Definition	Property	Description
1	NC	/	/
2	VDD	power	2.8V output
3	DVDD	power	1.2V output
4	DOVDD	power	1.8V output
5	NC	/	/
6	GND	ground electrode	ground electrode
7	VDD	power	2.8V output
8	GND	ground electrode	ground electrode
9	I2C3_SDA	input/output	SDA signal
10	I2C3_SCL	output	SCL signal

11	RST	output	reset signal
12	PWDN	output	Power down control
13	GND	ground electrode	ground electrode
14	MCLK	output	master clock
15	GND	ground electrode	ground electrode
16	D3P	input/output	Mipi Data channel 3 positive
17	D3N	input/output	Mipi Data channel 3 negative
18	GND	ground electrode	ground electrode
19	D2P	input/output	Mipi data channel 2 positive
20	D2N	input/output	Mipi data channel 2 negative
21	GND	ground electrode	ground electrode
22	D1P	input/output	Mipi data channel 1 positive
23	D1N	input/output	Mipi data channel 1 negative
24	GND	ground electrode	ground electrode
25	CLKP	input/output	Mipi clock channel positive
26	CLKN	input/output	Mipi clock channel negative
27	GND	ground electrode	ground electrode
28	D0P	input/output	Mipi data channel 0 positive
29	D0N	input/output	Mipi data channel 0 negative
30	GND	ground electrode	ground electrode

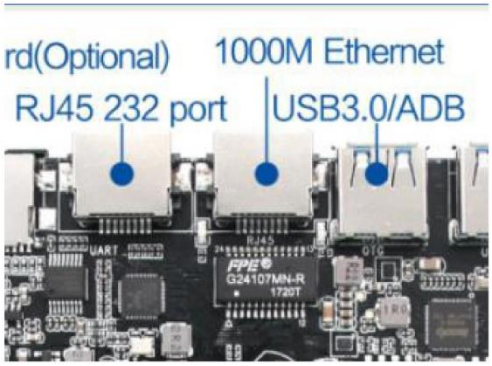
- **Speaker interface**



NO.	Definition	Property	Description
1	OUTP-L	output	Audio output right+
2	OUTN-L	output	Audio output right-
3	OUTN-R	output	Audio output left-
4	OUTP-R	output	Audio output left+

- **Network interface**

The board can support up to 1000m network port and a rj45 connector's rs232 level serial port, these two kinds of connection method according to the actual product.



- **Key instruction**

Uboot key burning program, press before power down, one key restore to press the key to restore to the initial state, press reset button system reset, press switch button system shut down.

- **Some other standard interfaces and functions:**

memory interface	SD card(optional)	Data storage, maximum support 32G
	USB	Host interface, data storage support, data import, USB mouse keyboard, camera, touch screen, etc.
Ethernet interface	RJ45 interface	Support a 100m wired network
HDMI interface	standard interface	Support for hdmi data output, maximum support 1080P
Earphone interface	standard interface	3.5mm standard interface

3G interface	PCI-E standard interface	support variable PCI-E 3G 4G module, Huawei, ZTE etc.
SIM card interface	standard interface	support variable system (depend on 3G module)

Chapter 4. Electric Performance

Project		Min	Typical	Max
Power parameter	voltage	--	12V	--
	ripple wave	--	--	50mV
	current	3A		
Power current (HDMIoutput,no other peripheral)	working current	--	200mA	600mA
	standby current	--	17mA	20mA
	USB power supply current	--	--	500mA
Power current(LVDS)	3.3V working current		400 mA	500 mA
	5V working current		550 mA	1A
	12V working current		580 mA	1A
	USB power supply current	--	--	500mA
Power current(eDP)	3.3V working current		400 mA	500 mA

	5V working current	--	--	--
	12V working current	--	--	--
	USB supply current	--	--	500mA
Total output	current	3.3V		800mA
Environment	Relative humidity	--	--	80%
	working temperature	0℃	--	60℃
	Storage temperature	-20℃		70℃

Remark 1: When connect the LVD screens, need to pay attention to select the right backlight working voltage 3.3V, 5V, 12V, the users cannot be applied to beyond the corresponding maximum current peripherals.

Remark 2: When connect the LVD screens, the board of the whole working current and standby current depending on the connection screens, above form not listed.

Chapter 5 Assembly Using Notice

In the process of assembly use，please note the following points (and not limited to) problem.

一， Bare board and a peripheral short circuit problem.

二， In the process of installing fixed， avoiding the bare board deformation caused by fixed problems.。

三， When connect eDP/LVDS screen，notice if the screen voltage and current match 。Attention to the problem of screen socket 1 pin direction.

四， When connect the eDP/LVDS screens，pay attention to the screen backlight voltage, electric current if is coincident.The backlight power is more than 20W, whether or not to use other power panel power supply.

五， Peripheral devices (USB, IO, etc) when installation，attention to the problem of peripheral IO level and current output。

六， A serial port when installation，pay attention to whether connect 232,485 devices directly. TX，RX connection if is correct.

七， Whether the input power supply access on the power input interface，according to the total peripheral evaluation， whether can meet the requirements of the input power supply voltage, electric current and so on. To eradicate facilitate the operation from a backlight socket for access to the power supply input power.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