DS-830 V3.0

3G datasheet

Doc. Modification History

Version	Description	Date
V1.0	Creation	2015-11-27

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Chapter 1. Production General Description

1.1 General Description

DS-830 control board combines multimedia decoding, LCD driver,Ethernet,HDMI,WIFI,3G, and TVin in one, supporting most current fashionable video and image format decoding, HDMI output and double eight LVDS driver ,which can drive variable TFT LCD panels ,greatly simplify system design of whole machine, SD card and locker SIM card booth, having stronger stability and suitable for high-definition network broadcast box, video advertising machine and frame advertising machine.
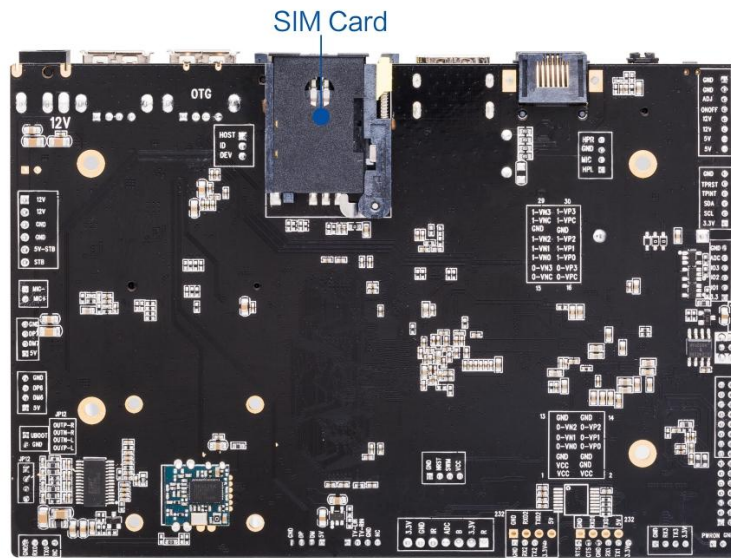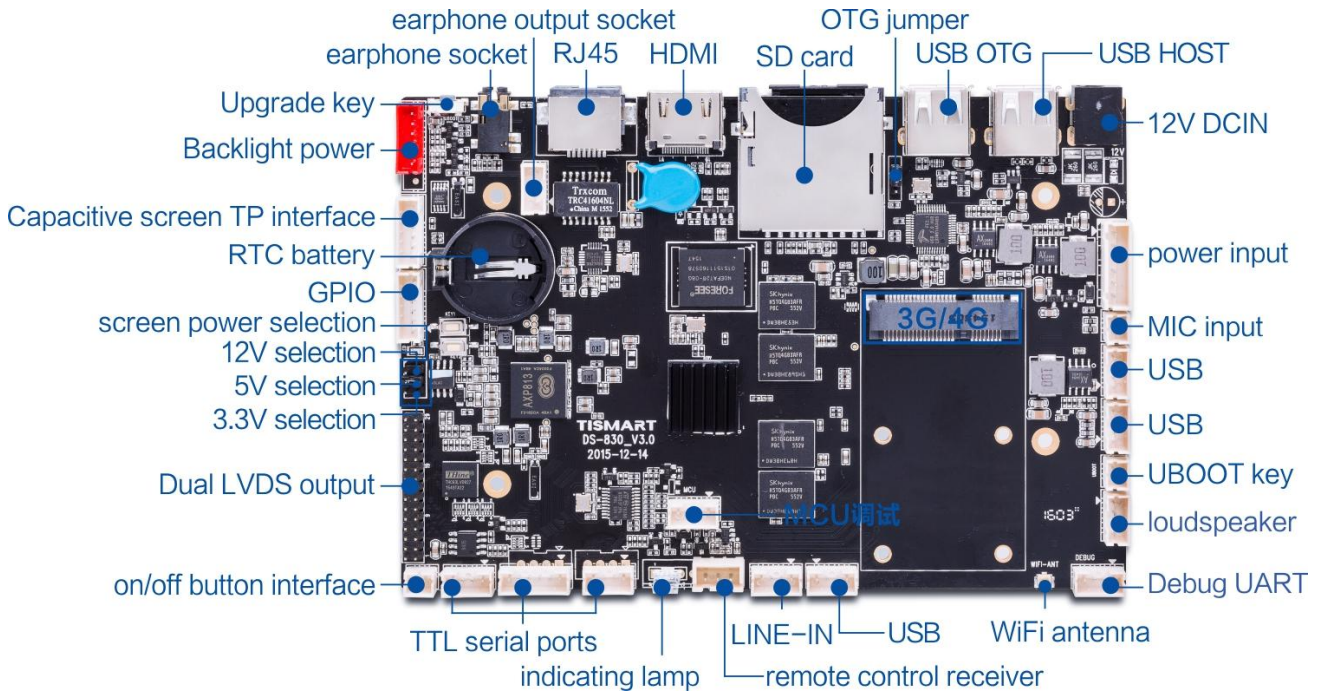
1.2 Features

- ◆ High integration density: Integrating USB/LVDS/Ethernet/HDMI/WIFI in one and simplifying design of whole machine. SD card can be inserted.
- ◆ Built-in PCI-E 3G module. Supporting Huawei, ZTE and multiple PCI-E 3G/4G module, more suitable for remote maintenance of advertising all-in-one machine, saving labor cost.

- Ample extended interfaces. 6 USB ports (4 pins,2 standard USB ports),3 extensible serial ports and GPIO/ADC ports, satisfying requirement of variable peripherals in the market.

- High definition. Maximum supporting 1080P decoding and variable LCD screens with LVDS signal.

- Completed function. Supporting function of portrait and landscape mode playing, video multi-screen, scrolling caption, timing switch, USB data input and so on.

- Convenient management. : Humanized playlist maker software, easy for advertising play management and control. Play log, easy for knowing the play.

1.3 Appearance and Interface Sketch

Front/Back :

:

earphone output socket
OTG jumper

earphone socket | RJ45 | HDMI | SD card | USB OTG | USB HOST

Upgrade key

Backlight power

12V DCIN

Capacitive screen TP interface

RTC battery

power input

GPIO

screen power selection

MIC input

12V selection

USB

5V selection

USB

3.3V selection

UBOOT key

Dual LVDS output

loudspeaker

on/off button interface

Debug UART

TTL serial ports

LINE-IN | USB

indicating lamp

WiFi antenna

remote control receiver

3G/4G

MCU调试

TISMART
DS-830_V3.0
2015-12-14

SIM Card

OTG

12V

Chapter 2. Basic Function List

| Main Hardware Index	
CPU	A83T , Octa-Core , main frequency 2GHz
Internal Memory	1/2G(optional)
Built-in Memory	EMMC 4/8/16/32G(optional)
Built-in ROM	2KB EEPROM
Decoding Definition	maximum support 1080P
Operating System	Above Android 4.X
Play Mode	support loop, timing, inter-cut and variable play modes
Network Support	Ethernet、support WiFi、wireless peripheral extension
Video Playing	Support wmv、avi、flv、rm、rmvb、mpeg 、ts、mp4 etc.
Image Format	Support BMP、JPEG、PNG、GIF
USB2.0 Ports	2 USB HOST、4 USB ports
Serial Ports	3 serial ports
GPS	External GPS（optional）

WIFI、BT	built-in WIFI，BT4.0（optional）
3G	built-in WCDMA,EVDO,4G NetMosa,support voice call
Ethernet	1，10M/100M self-adapting Ethernet
SD Card	Support SD card
LVDS output	1 single/dual channel，can drive 50/60Hz LCD panel directly
HDMI output	1, support 1080P output
Audio And Video Output	support left and right channels output, built-in dual 4R/20W,8R/10W amplifier
RTC Real Time Clock	Support
Timing Switch	Support
System Upgrade	Support local SD,USB upgrade

The producted have external antenna, The max antenna gain is 5dBi. if you used other antenna, the FCC will be apply again.
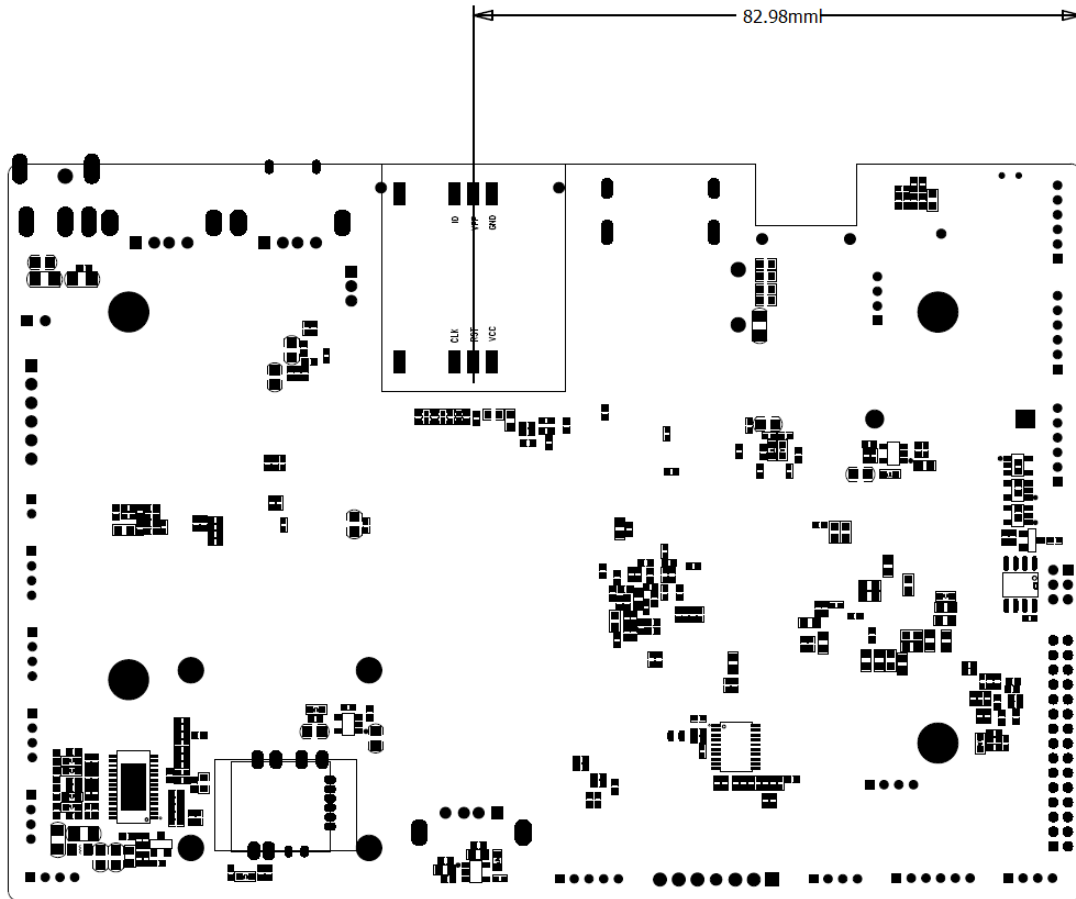
Chapter 3.PCB Measurement And Interface Layout

3.1 PCB Measurement Chart

82.98mm
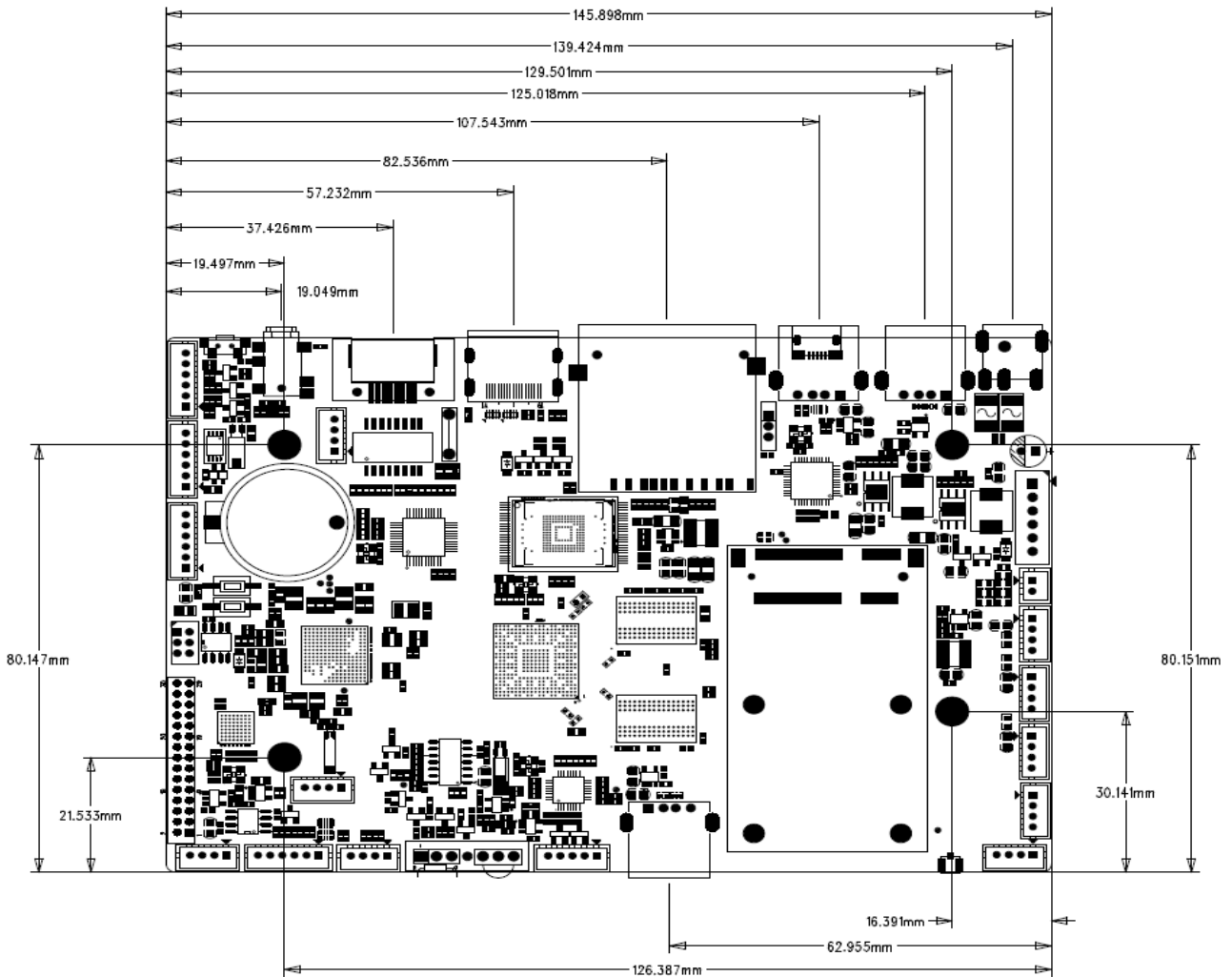
PCB：6 layers

Measurement：146mm*100mm, thickness 1.6mm

Screw hole specification：φ3.2mm x 4

3.2 Interface Parameter Definition

◆Power Input Port

Use 12V DC power supply，only allowed from the DC power supply and power socket to power the board system，the plug of the power adapter DC IN specifications is D6.0, d2.0. without in a peripheral empty load cases,12V dc power supply to support the minimum current 600 mA.

Power socket interfaces are defined as follows，can use power panel power supply，the socket specifications is 6 pin 2.54 mm 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	VCC-5V	input	standby 5V input
6	STB	output	standby signal output

◆ Standby 5V input & standby signal output is used as standby power supply board，if want to do low standby power consumption，the standby 5V input & standby signal output signal respectively connected with the 5 v power supply board STB and PS_ON（the description of the two signals might be different from different suppliers of power supply board，Please refer to the actual），If you don't need to do low standby power consumption,then no need to connect the 2 pins.

◆ **BAT1 RTC Battery Port**

Used to install the clock battery，supply power to the system clock when power outages.

RTC battery
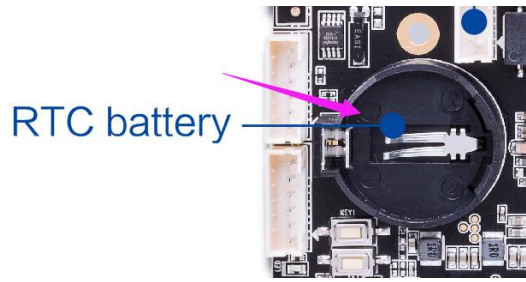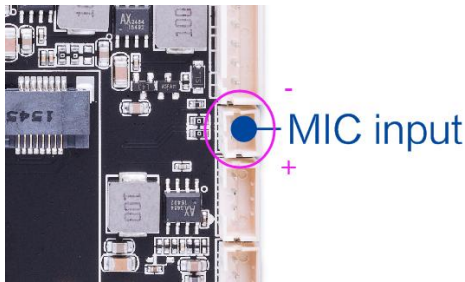
Images of welding is a 1.25 mm spacing of 2 pin wafer socket，to reduce the overall height of board，can choose welding standard 2032 battery socket

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.

MIC input

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

◆ **Port Of Receiving Remote Control**

IR GND 3V3
remote control receiver

Images of welding is a remote control receiving head，the default three pin socket weld 2.54 mm spacing when out of the factory.

NO.	Definition	Property	Description
1	IR	input	remote control signal input
2	GND	ground electrode	ground electrode
3	VCC	Power	3.3V output

◆ **Work Indicating Lamps**

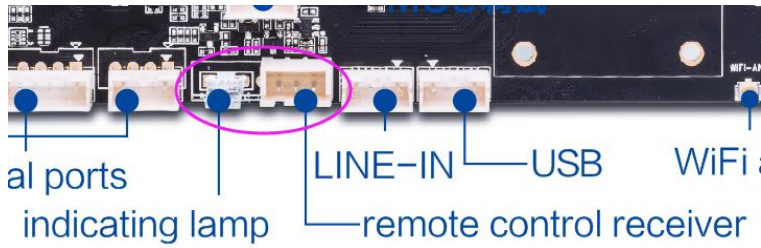| NO.	Definition	Property	Description
1	LED_B	blue lamp	work indicating lamp
2	VCC	power	3.3V output
3	LED_R	red lamp	standby indicating lamp

◆
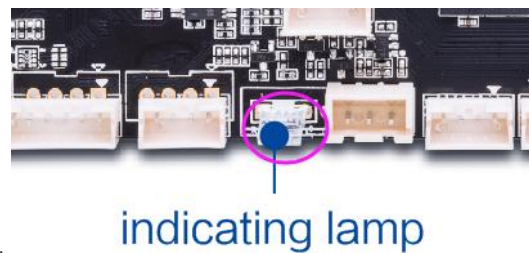
indicating lamp

The default support gongyang red blue double LED lights.

◆ **LED/IR Port**

The position of remote control receiving and indicating light is shared（can choose welding 2.54 mm spacing of 7 pins socket）。

al ports
indicating lamp
LINE-IN — USB — WiFi
remote control receiver

NO.	Definition	Property	Description
1	LED_B	output	work indicating lamp
2	VCC	power	3.3V output
3	LED_R	output	standby 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**

Use for LVDS screen backlight control，the 12V power supply current is not more than 1.5A，When using more than 19 inch screen or screen backlight power in more than 20W， backlight power supply electricity is taken from the other power plate，so as not to cause system instability.Backlight can make voltage is 5V , if other voltage, please add IO level conversion circuit. **The 12V power supply only as a backlight power output, don't as a power input supply system.**
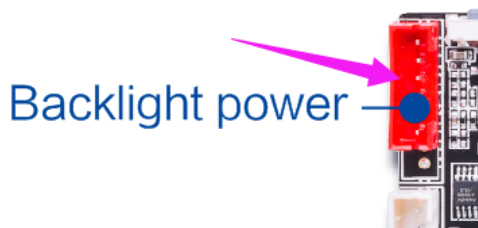

Backlight power

NO.	Definition	Property	Description
1	VCC	power	12V output
2	VCC	power	12V output

3	BL-EN	output	backlight enable control
4	BL-ADJ	output	backlight brightness adjust control
5	GND	ground electrode	ground electrode
6	GND	ground electrode	ground electrode

◆ I/O Control Port

Used for provide control signal input/output of peripherals，Level of 3.3V，ADC signal can be used to button control。
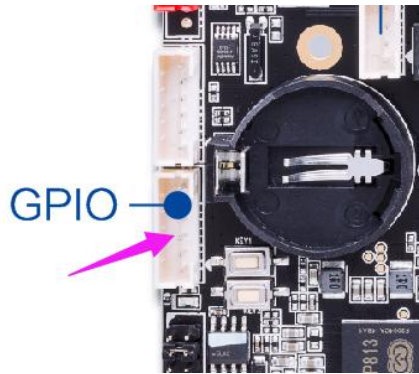
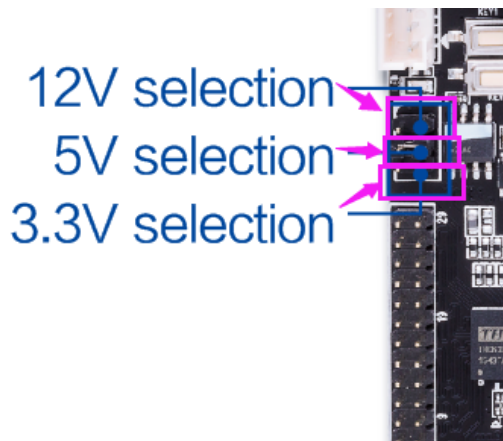| NO.	Definition	Property	Description
1	VCC	power	3.3V output
2	I/O	input	GPIO-1
3	I/O	input	GPIO-2
4	I/O	output	GPIO-3
5	ADC	input / output	ADC signal
6	GND	ground electrode	ground electrode

◆ LVDS Port

Commonly used LVDS interface definitions，support single/ double channels，6/8 bits 1080P LVDS screen. Screen voltage can be choose by jumper cap，can choose to support   3.3V/5V/12V screen power supply.

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

1.Please make sure the specifications and power supply voltage of the screen is correct,the power supply of the board can meet the maximum current screen work accordingly

2.Please confirm the power of the jumper cap is correct by multimeter.

Using jumper cap to select the power of the screen above, from top to bottom,in order：12V/5V/3.3V.

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	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 electrode	ground electrode
14	GND	ground electrode	ground electrode
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 electrode	ground electrode
26	GND	ground electrode	ground electrode
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)

◆ TTL double-wire serial interface socket*2

The board raises two groups of ordinary double-wire serial interface，can support general serial port devices on the market，level of the serial port is 0V to 3.3V.If the abutting serial level higher than 3.3 V，must have the isolating circuit or level conversion circuit, otherwise it will burn out master and equipment.

Notice：

1.If TTL serial port voltage can match or not，can't directly access MAX232,485 devices.

2.TX，RX connection if is correct.
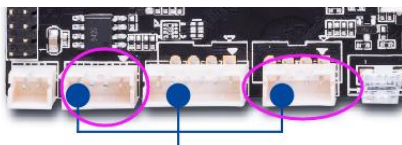
TTL serial ports

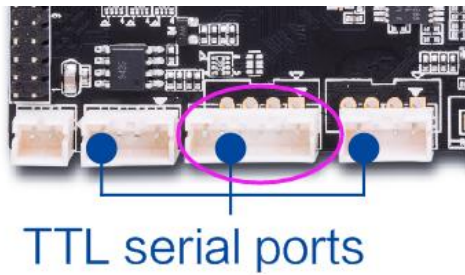| NO.	Definition	Property	Description
1	GND	ground electrode	ground electrode
2	UART- RX	input / output	RX
3	UART- TX	input / output	TX
4	VCC	power	3.3V output

◆ TTL four-wire serial interface socket *1

The board raises one group of ordinary four-wire serial interface，can support general serial port devices on the market，level of the serial port is 0V to 3.3V.If the abutting serial level higher than 3.3 V，must have the isolating circuit or level conversion circuit, otherwise it will burn out master and equipment.

Notice：

1.If TTL serial port voltage can match or not，can't directly access MAX232,485 devices.

2.TX，RX connection if is correct.

TTL serial ports

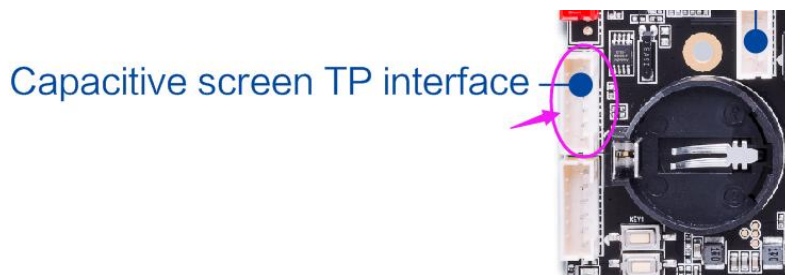| NO.	Definition	Property	Description
1	UART-RTS	input /output	RTS
2	UART-CTS	input / output	CTS
3	GND	ground electrode	ground electrode
4	UART-RX	input / output	RX
5	UART-TX	input / output	TX
6	VCC	power	3.3V output

◆ **USB**

The board has 2 USB standard interface，4 built-in USB serial port，used for peripheral extended，the default is HOST，power supply current is not more than 500mA，for the USB OTG port，can select Host/Device by the jumper cap position as below picture.
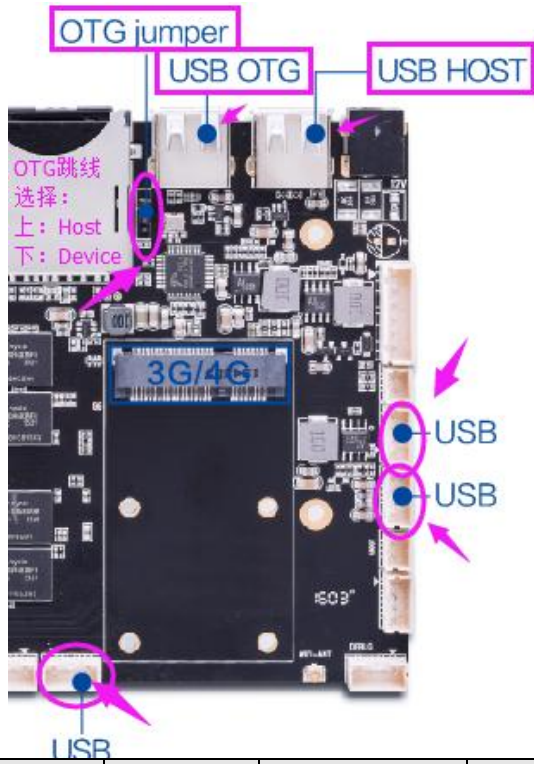
NO.	Definition	Property	Description
1	VCC	power	5V output
2	DM	input / output	DM
3	DP	input / output	DP
4	GND	ground electrode	ground electrode

◆ **Touch Screen Port**

NO.	Definition	Property	Description
1	VCC	power	3.3V output
2	SCK	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

◆ **LINE_IN interface**

LINE-IN
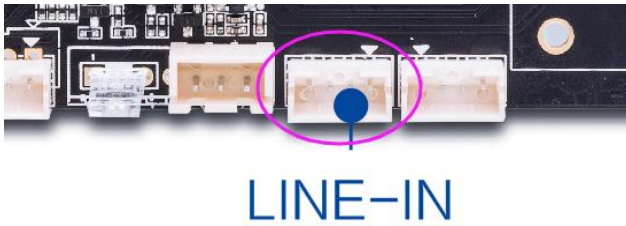
NO.	Definition	Property	Description
1	LIN	input	left channel audio input
2	RIN	input	right channel audio input
3	GND	ground electrode	ground electrode
4	NC	empty	unused

◆ **Audio Port 1(External amplifier needed)**
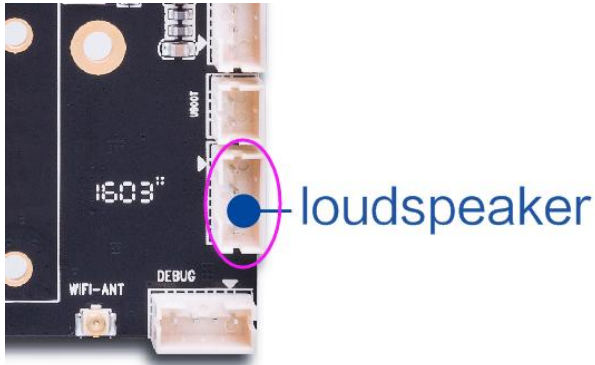
earphone output socket
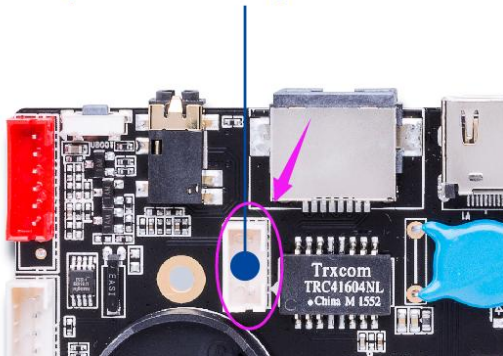
NO.	Definition	Property	Description
1	AL	output	audio output left
2	HS-MIC	input	detection of headset insert
3	GND	ground electrode	ground electrode

| 4	AR	output	audio output right

◆ **Audio Port 2(can drive loudspeaker directly)**

NO.	Definition	Property	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-

◆ **Switch machine button interface**

NO.	Definition	Property	Description
1	PWR-ON	input	a pin of an external light touch button
2	GND	ground electrode	another pin of an external light touch button

◆ **Uboot update key**

UBOOT key
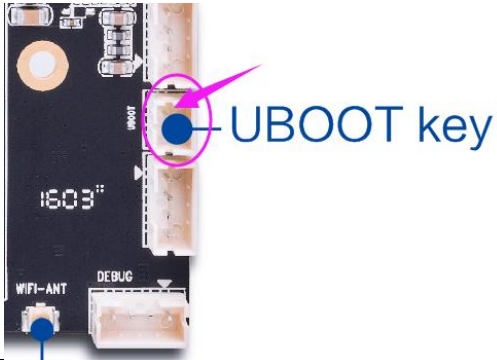
NO.	Definition	Property	Description
1	Uboot	input	Connect uboot pin
2	GND	gnd	Connect uboot pin

◆ **Other Standard Interfaces And Function:**

Memory Port	SD/TF card	data storage, maximum support 32G
	USB	HOST port, support data storage, data input, USB, mouse keyboard, camera, touch screen etc.
Ethernet Port	RJ45 port	support 100M wired network
HDMI Port	standard port	support HDMI data output, maximum support 1080P
Earphone Port	standard port	3.5mmstandard port
3G Port	PCI-E standard port	support variable PCI-E 3G 4G module, Huawei, ZTE etc.
SIM Card Port	standard port	support variable system (depend on 3G module)

Chapter 4. Electric Performance

Project		Min	Typical	Max
Power voltage	voltage	--	12V	--
	ripple wave	--	--	50mV
Power voltage	current	3A		
Power current (HDMIoutput,no other peripheral)	working current	--	300mA	500mA
	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
Total output	current	3.3V		800mA
Environment	Relative	--	--	80%

	humidity			
	working 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 the LVD screens , pay attention to the screen voltage, electric current if is coincident. Attention to the problem of screen socket 1 pin direction.

四, When connect the LVD 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 232485 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.