Touch Think Intelligence Product Specification

Mainboard series

JWS3399

V1.8

Shenzhen Touch Thinking Intelligent Co., Ltd.

CONTENTS

Chapter 1 Introduction

1.1Applicability

JWS3399 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

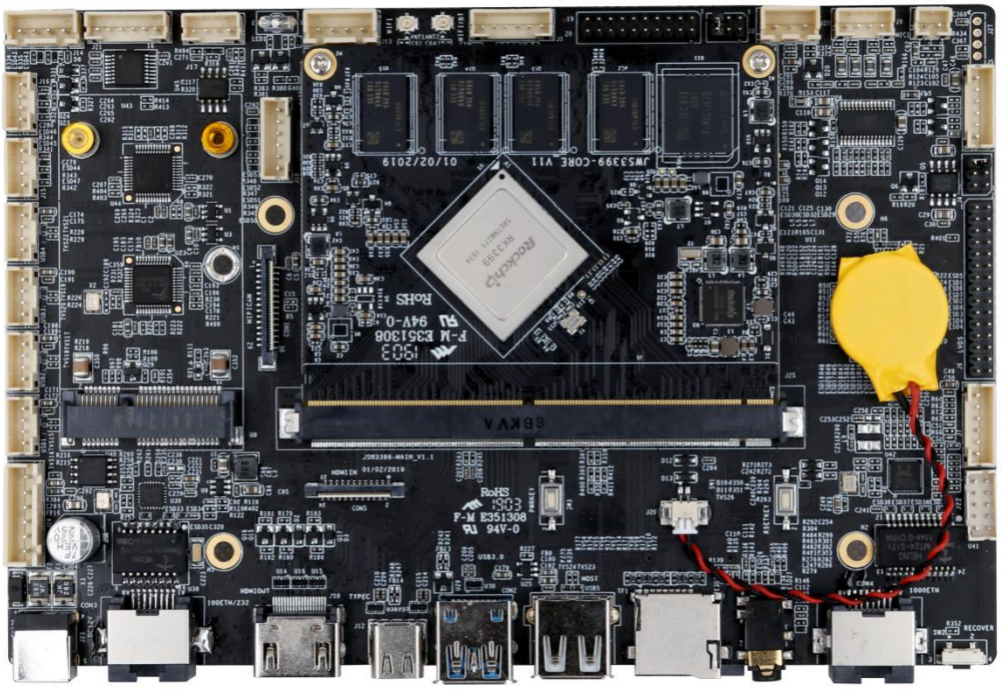
JWS3399 uses RK3399,a 64bit supper processor with dual-core Cortex-A72 and quad-core Cortex-A53,its basic frequency is 1.8GHz,JWS3399 Uses Mali-T860 GPU, it has H.265 hardware decoder to supports 4K display. JWS3399 integrated Dual-LVDS, EDP, HDMI display output interfaces to itself, with common backlight panel interface and screen level jumper, JWS3399 is compatible to various types of display screen.With powerful performance and fast process speed, JWS3399 is your best choice for human-computer interaction, intelligent terminal and industrial control projects.

1.3 Features

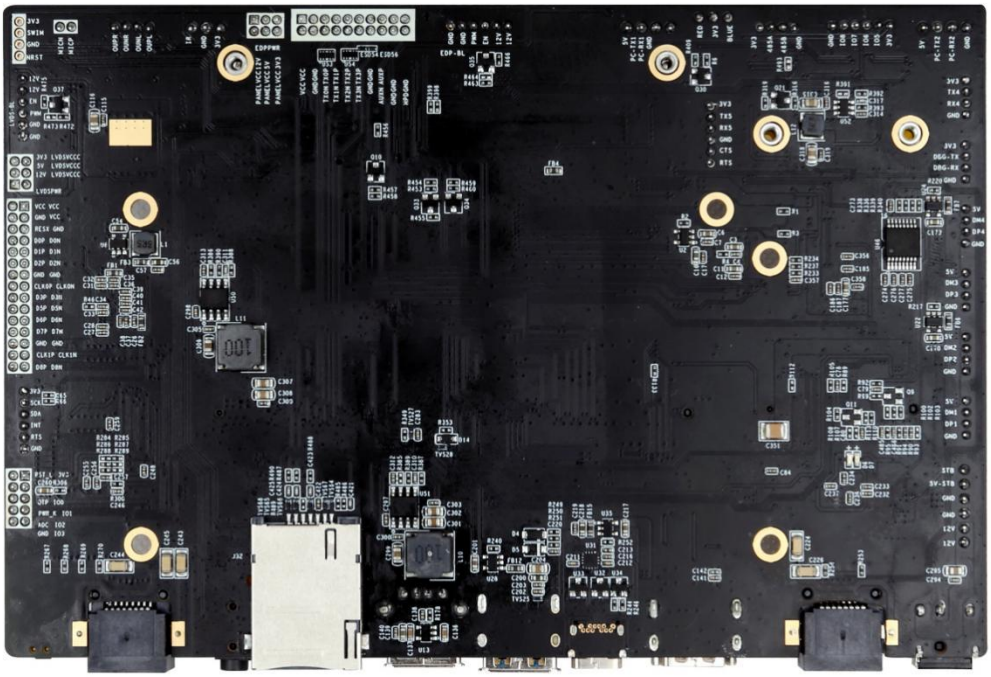
- Various display interfaces: Dual-LVDS, EDP, HDMI etc.
- Various expansion interfaces: JWS3399 has seven USB ports(A TYPEC and four internal expansion ports, two USB standard ports.), a 485 port, four expansion serial ports(TTL*2, one has hard flow control, RS232*2), GPIO port and ADC port,JWS3399 can satisfy your customization requirement.
- Various internet:100M,1000M Ethernet, 5G/2.4G WIIF supported, Independent dual-antenna, built-in PCI-E 3G/4G module.
- High definition.JWS3399 supports 4K 3840x2160 decoding, it also supports Special-shaped screen with LVDS/EDP/HDMI interfaces and it has multi-monitor extend display mode.
- Android system customization. JWS3399 provides system calling interface and API reference code, it supports upper-layer applications development perfectly.
- JWS3399 supports infrared, optical, capacitance, resistance and other mainstream touch screen, it also supports drive-free HID configuration which no need to debug before using.

1.4 Front/Back Side Picture

【Front】



【Back】



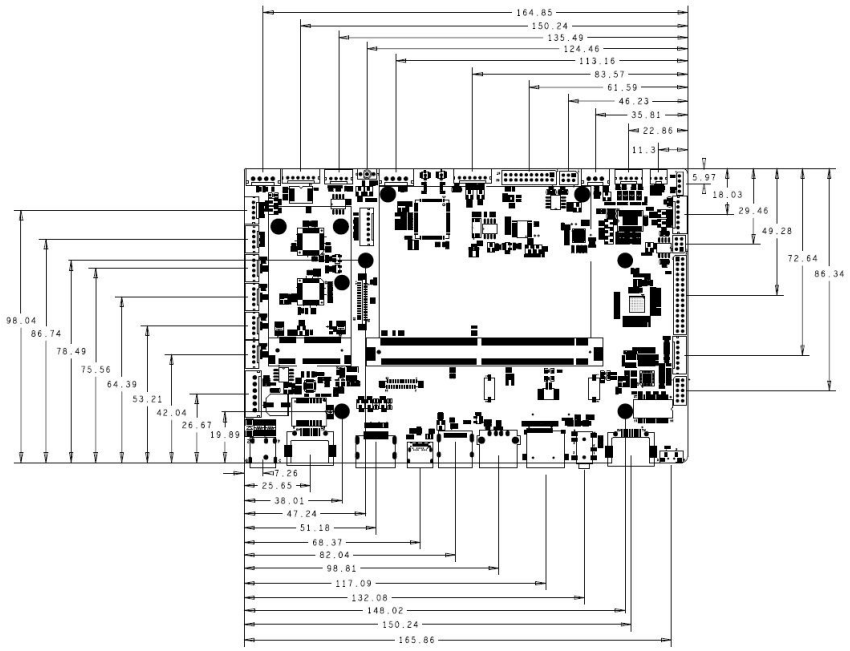
Chapter 2 Basic Informatio

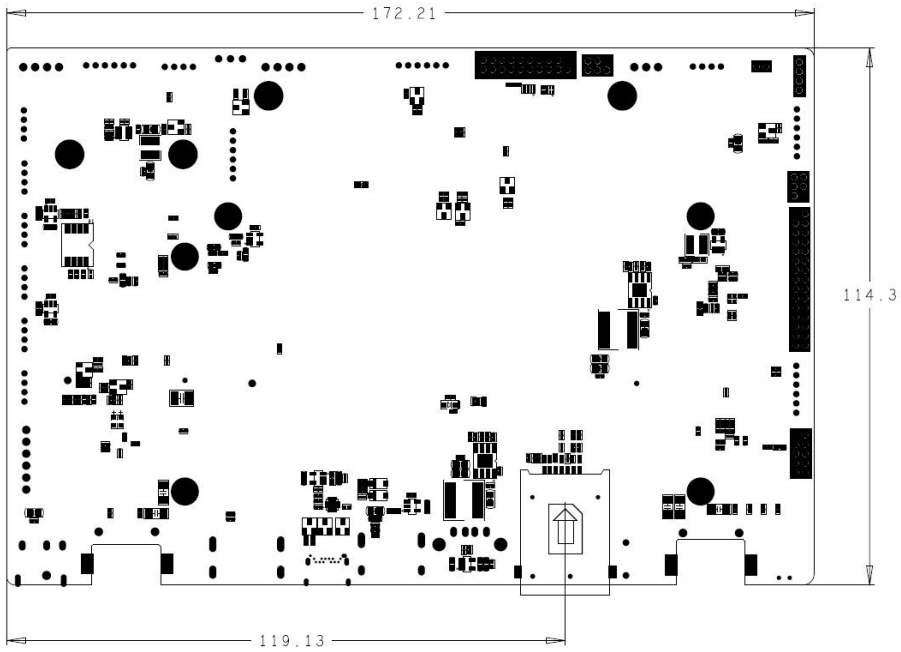
ITEM	Specifications
CPU	64Bit processor. Dual-core Cortex-A72 up to 1.8GHz Quad-core Cortex-A53 up to 1.4GHz
GPU	Quad-core ARM Mali-T860MP4 GPU
Memory	4G(2G optional)
Storage	EMMC 32G(8/16/64G optional,maximum 64G)
ROM	4KB EEPROM
Resolution	Maximum 3840*2160
OS	Android 7.1/9.0/11 Ubuntu18.04/Debian10.0/linux4.4+QT
Play Mode	Supports multiple play modes such as loop,timing and interstitial.
Network	3G,Ethernet,WiFi/BT5.0,Wireless peripheral extension
Video Format	Support WMV,AVI,FLV,RM,RMVB,MPEG,TS,MP4 etc
Photograph Format	Support BMP,JPEG,PNG,GIF
USB	TYPE C*1,USB standard*2,USB interface*4
MIPI Camera	30pin FPC interface, 1300w Camera supported
Serial Port	RS232*2,485*1,TTL*2,DEBUG port*1
GPS	External GPS(Optional)
WIFI、BT	Built-in d WIFI,BT5.0 (Optional) ,dual frequency WIFI and dual-antenna supported
3G/4G	Built-in WCDMA,EVDO,unlocked 4G,VolET supported
Ethernet	100M*1,1000M*1
TF Card	Trans flash Card supported
LVDS	LVDS*1(single/dual channel),support 50/60Hz LCD panel

EDP	Support Multi-resolution EDP interface LCD panel
HDMI	HDMI*1, support 1080P@60Hz，4kx2k@60Hz output
HDMI IN	HDMI Input,24pin FPC customized interface
AV Output	Support left and right channel output, built-in dual 4R/20W，8R/10W amplifier
Real Time Clock	Supported
Timing turn on/off	Supported
OS upgrade	Support USB upgrade

Chapter 3 PCB And Interface

3.1 PCB Drawing





PCB：4 layers board

Size：172.2*114.3mm，Thickness :1.6mm

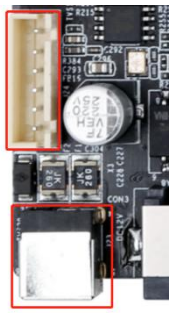
Screw hole size：ϕ3.2mm * 4

3.2 Interface Parameter Define

◆ Power Input

12V DC power supply, motherboard can only uses power input from DC port and power port, the adaptor DC input connector SPEC is D5.5, d2.0.

When board is under idling state, the minimum current 12V DC power supported is 600mA.

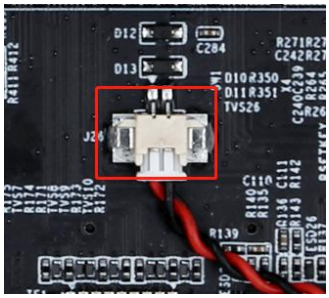


Interface definition as below list,user can apply power board input power supply, interface have 6PIN and 2.54mm pin distance.

SN	Define	Property	Description
1	VCC	INPUT	12V Input
2	VCC	INPUT	12V Input
3	GND	GROUND	Ground
4	GND	GROUND	Ground
5	5V-STB	INPUT	5V Input
6	STB	I/O	Connect to MCU pin

◆ RTC Battery

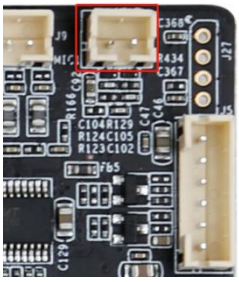
Supply power to OS clock when outside power is off.



SN	Define	Property	Description
1	RTC	INPUT	3V Input
2	GND	GROUND	Ground

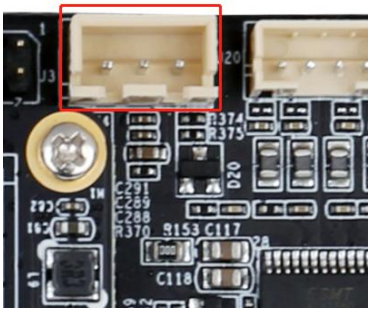
◆ MIC

Please mind MIC P/N poles.



SN	Define	Property	Description
1	MIC1N	INPUT	MIC-
2	MIC1P	INPUT	MIC+

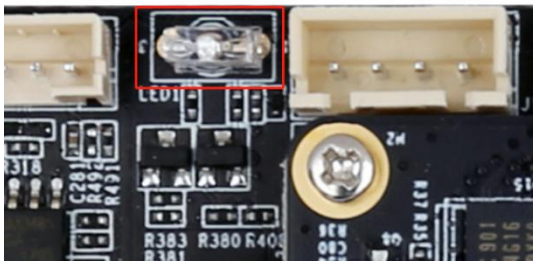
◆ Telecontrol



SN	Define	Property	Description
1	IR	INPUT	Telecontrol signal Input
2	GND	GROUND	Ground
3	3V3	Power	3.3V Output

◆ Indicator

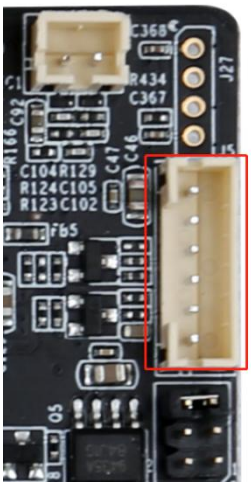
Default common anode RED/BLUE LED light.



SN	Define	Property	Description
1	LED_B	Blue	Work state indicator
2	VCC	Power	3.3V Output
3	LED_R	Red	Standby state indicator

◆ LVDS Backlight Control Port

This port is designed for LVDS panel's backlight control function, the current of 12V power supply is 2A, if screen backlight power beyond 24W, in order to prevent system unstable, please connect backlight cable to other power panel.This interface can only be used to supply backlight power, never connect it to other device as power input.



SN	Define	Property	Description
6	VCC	Power	12V Output
5	VCC	Power	12V Output
4	EN	OUTPUT	Backlight dis/enable control
3	PWM	OUTPUT	Backlight brightness control
2	GND	GROUND	Ground
1	GND	GROUND	Ground

◆ LVDS Screen

Common LVDS pin definition, support single/dual, 6/8bit LVDS panel, user can change port voltage level by move jumper cap position, 3.3V/5V/12V optional.

To prevent motherboard and screen panel burning-out, please notice below:

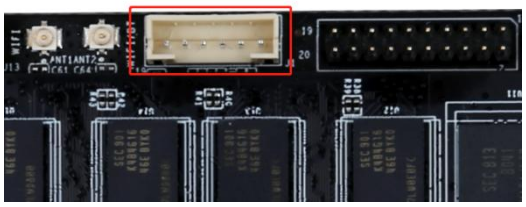
1.Confirm LVDS screen panel's voltage in SPEC is correct and it's correspond to motherboard power supply, please also confirm that motherboard can provide maximum current which LVDS screen panel required.

2.Please use multimeter to test motherboard output voltage, make sure jumper cap mounted on the right position.

SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD power Output, +3.3v/+5V/+12V(Optional)
2			
3			
4	GND	GROUND	Ground
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	Ground
14	GND	GROUND	Ground
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	Ground
26	GND	GROUND	Ground
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)

◆ EDP Screen Backlight Port

This port is designed for EDP panel's backlight control function, the current of 12V power supply is 2A, if screen backlight power beyond 24W, in order to prevent system unstable defect, please connect backlight cable to other power panel.Backlight dis/enable control voltage is 5V, if EDP screen require other voltage, please add a IO level-shift circuit.This port can only be used to supply backlight power, never connect it to other device as power input.

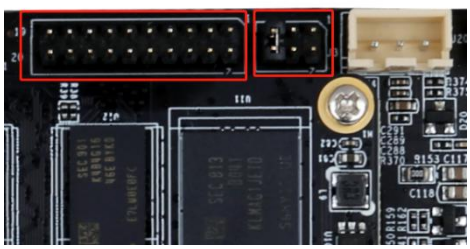


SN	Define	Property	Description
6	VCC	Power	12V Output
5	VCC	Power	12V Output
4	EN	OUTPUT	Backlight dis/enable control
3	PWM	OUTPUT	Backlight brightness control
2	GND	GROUND	Ground
1	GND	GROUND	Ground

◆ EDP Screen Interface

Jumper cap can be mounted in different position(see below picture left side) to change power output(3.3V/5V/12V), pleas take a look at silkscreen on PCB backside.

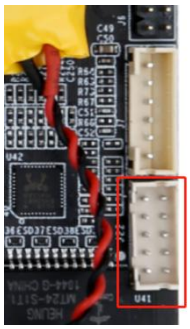
Please check the pin definition on motherboard and cable, make sure pin on cable and board is aligned(pin1 to pin1 for example).

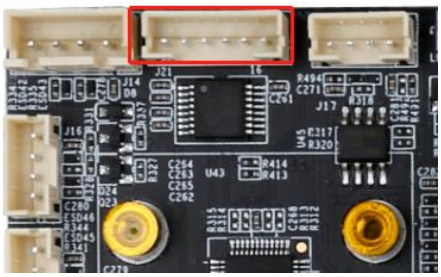


SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD Power Output，+3.3V/+5V/+12V optional
2			
3	GND	GROUND	Ground
4			
5	TX0P	Power	LCD Power Output，+3.3V/+5V/+12V
6	TX0N	GROUND	Ground
7	TX1P	Power	LCD Power Output，+3.3V/+5V/+12V
8	TX1N	GROUND	Ground
9	TX2P	Power	LCD Power Output，+3.3V/+5V/+12V
10	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	GROUND	Ground
14	GND	GROUND	Ground
15	AUXP	OUTPUT	EDP AUX Positive Data (Odd)
16	AUXN	OUTPUT	EDP AUX Negative Data (Odd)
17	GND	GROUND	Ground
18			
19			
20	HPD	INPUT	EDP DETECT

◆ IO

This port provide I/O control signal for peripheral devices, level is 3.3V, ADC signal can be used as button control. It also added a power on/off switch pin.





SN	Define	Property	Description
1	VCC	Power	3.3V Output
2	I/O0	INPUT/OUTPUT	IO port
3	I/O1	INPUT/OUTPUT	IO port
4	I/O2	INPUT/OUTPUT	IO port
5	I/O3	INPUT/OUTPUT	IO port
6	RST_L	INPUT	Reset 0
7	OTP	INPUT	Reset 1
8	ADC	INPUT	ADC signal
9	PWR_K	INPUT	System power on/off
10	GND	GROUND	Ground

SN	Define	Property	Description
6	VCC	Power	3.3V Output
5	IO5	INPUT/OUTPUT	IO port
4	IO6	INPUT/OUTPUT	IO port
3	IO7	INPUT/OUTPUT	IO port
2	IO8	INPUT/OUTPUT	IO port
1	GND	GROUND	Ground

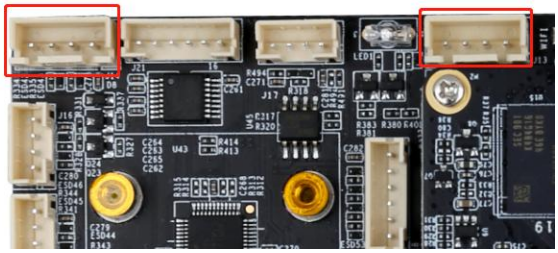
◆ 232 *2

Motherboard provides two 232 serial ports which can support mainstream 232 serial ports devices.

Note:

1.232 serial port level on motherboard must match with device’s level, those serial ports don’t support TTL/485 device connect directly.

2.TX/RX pin connected to cable TX/RX pin correctly.



SN	Define	Property	Description
1	GND	GROUND	Ground
2	PC-RX	INPUT	232-RX
3	PC-TX	OUTPUT	232-TX
4	VCC	Power	5V Output

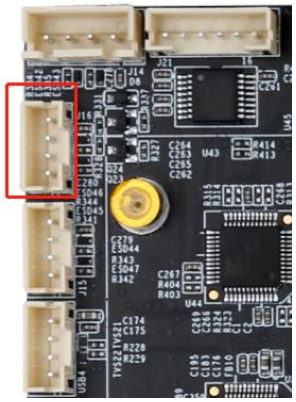
◆ TTL *2

Board provides 2 TTL serial ports which can support mainstream serial ports devices. The voltage for TTL serial ports is 0V~3.3V, if device connected request higher voltage, there must be an isolate circuit or level-shift circuit, otherwise board and device might get burnout.

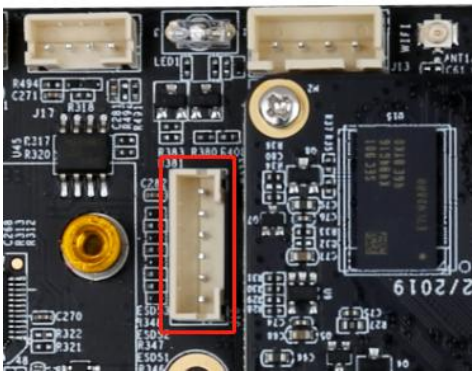
Note:

TTL serial port level must match with device's level, those port don't support MAX232/485 device connect directly.

TX/RX pin connected to cable TX/RX pin correctly（positive and negative for example）.

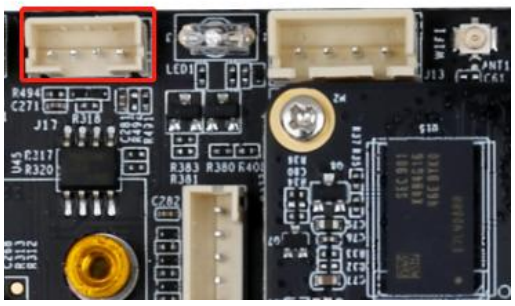


SN	Define	Property	Description
1	GND	GROUND	Ground
2	UART-RX	INPUT	RX
3	UART-TX	OUTPUT	TX
4	VCC	Power	3.3V Output



SN	Define	Property	Description
1	RTX	Handshaking	Request data sending
2	CTX	Handshaking	Request data reception
3	GND	GROUND	Ground
4	UART-RX	INPUT	RX
5	UART-TX	OUTPUT	TX
6	VCC	Power	3.3V Output

◆ 485



Motherboard provides a 485 serial port which can support mainstream serial ports devices. The voltage for 485 serial ports is 3.3V, if device connected require higher voltage, there must be an isolate circuit or level-shift circuit added, otherwise board and device might get burnout.

Note:

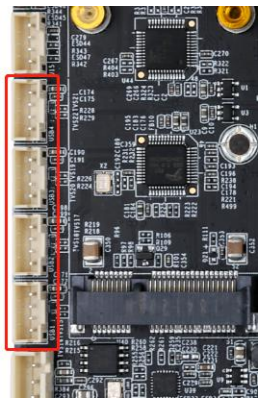
1.485 serial port level must match with device's level.

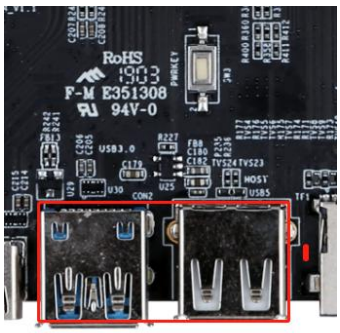
2.485A/485B pin must connected correctly to device.

SN	Define	Property	Description
1	GND	GROUND	Ground
2	485B	INPUT/OUTPUT	RX
3	485A	INPUT/OUTPUT	TX
4	VCC	Power	3.3V Output

◆ USB

Motherboard provides three USB standard ports and four internal USB ports for peripheral device expansion, USB default mode is HOST, power current must less than 500mA.



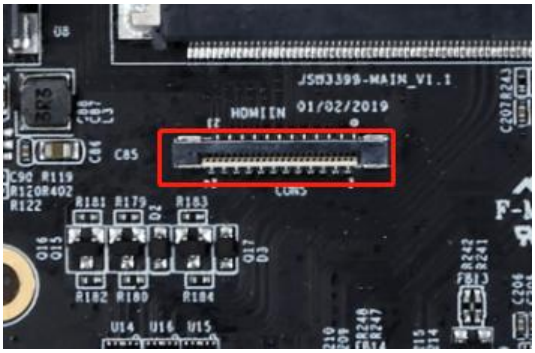


SN	Define	Property	Description
1	VCC	Power	5V Output
2	DM	INPUT/OUTPU	DM
3	DP	INPUT/OUTPU	DP
4	GND	GROUND	Ground

◆ Touch Screen

SN	Define	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	Ground

◆ HDMI IN

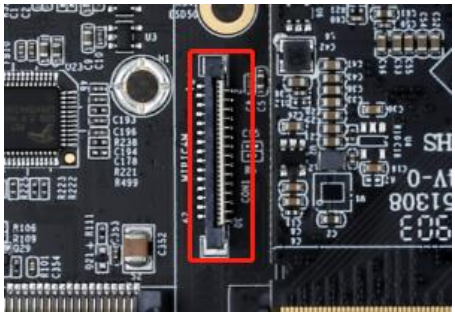


SN	Define	Property	Description
1	VCC	Power	5V Output
2	PWREN	OUTPUT	Power dis/enable
3	GND	GROUND	Ground
4	GND	GROUND	Ground
5	D0N	INPUT/OUTPU	MIPI Data Channel 0 Negative
6	D0P	INPUT/OUTPU	MIPI Data Channel 0 Positive
7	D1N	INPUT/OUTPU	MIPI Data Channel 1 Negative
8	D1P	INPUT/OUTPU	MIPI Data Channel 1 Positive
9	D2N	INPUT/OUTPU	MIPI Data Channel 2 Negative
10	D2P	INPUT/OUTPU	MIPI Data Channel 2 Positive
11	D3N	INPUT/OUTPU	MIPI Data Channel 3 Negative
12	D3P	INPUT/OUTPU	MIPI Data Channel 3 Positive
13	CLKN	INPUT/OUTPU	MIPI Clock Channel Negative
14	CLKP	INPUT/OUTPU	MIPI Clock Channel Positive
15	INT	INPUT	Interrupt

16	STBY	OUTPUT	Standby control
17	IR	INPUT	Undetermined
18	RST	OUTPUT	Reset Signal
19	I2S_LRCK	INPUT/OUTPU	I2S group signal
20	I2S_SCLK	INPUT/OUTPU	I2S group signal
21	I2S_MCLK	OUTPUT	I2S group signal
22	I2S_SDI	INPUT	I2S group signal
23	I2C4_SDA	INPUT/OUTPU	SDA signal
24	I2C4_SCL	OUTPUT	SCL signal

◆ Camera_IN

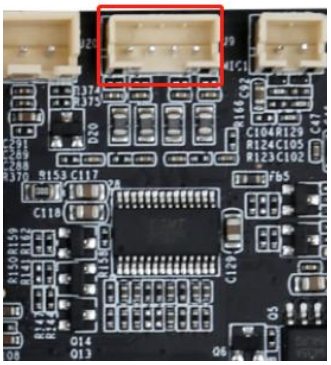
Motherboard can supports MIPI cameras with maximum 1300W pixels, the electrical definition as below:



SN	Define	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	Ground
7	VDD	Power	2.8V Output
8	GND	GROUND	Ground
9	I2C3_SD	INPUT/OUTP	SDA Signal
10	I2C3_SC	OUTPUT	SCL Signal
11	RST	OUTPUT	Reset Signal
12	PWDN	OUTPUT	Power Down

13	GND	GROUND	Ground
14	MCLK	OUTPUT	Main Clock
15	GND	GROUND	Ground
16	D3P	INPUT/OUTP	MIPI Data Channel 3 Positive
17	D3N	INPUT/OUTP	MIPI Data Channel 3 Negative
18	GND	GROUND	Ground
19	D2P	INPUT/OUTP	MIPI Data Channel 2 Positive
20	D2N	INPUT/OUTP	MIPI Data Channel 2 Negative
21	GND	GROUND	Ground
22	D1P	INPUT/OUTP	MIPI Data Channel 1 Positive
23	D1N	INPUT/OUTP	MIPI Data Channel 1 Negative
24	GND	GROUND	Ground
25	CLKP	INPUT/OUTP	MIPI Clock Channel Positive
26	CLKN	INPUT/OUTP	MIPI Clock Channel Negative
27	GND	GROUND	Ground
28	D0P	INPUT/OUTP	MIPI Data Channel 0 Positive
29	D0N	INPUT/OUTP	MIPI Data Channel 0 Negative
30	GND	GROUND	Ground

◆ Speaker



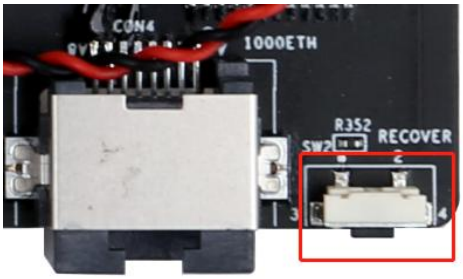
SN	Define	Property	Description
1	OUP-L	OUTPUT	Audio Output Left+
2	OUN-L	OUTPUT	Audio Output Left-
3	OUN-R	OUTPUT	Audio Output Right-
4	OUP-R	OUTPUT	Audio Output Right+

◆ Ethernet

Board support two connect methods, double net port(100M/1000M) or a 1000M net port and a RS232 level serial port with RJ45 connector, chose connect methods according to the actual condition.

◆ UBOOT

Press UBOOT button before power on to enter upgrade mode.



◆ Other Standard Interfaces And Functions

Storage	TF card	Data storage, maximum 1T
	USB	HOST interface， support data storage/input, USB mouse/key board, camera, touch screen etc.
Ethernet	RJ45	Support double 1000M/100M wired internet
HDMI	Standard	Support HDMI data output, maximum definition 1080P
Audio	Standard	3.55mm standard interface
3G	PCI-E Standard	Support HUAWEI,ZTE or other brand's PCI-E 3G/4G module
SIM	Standard	Support all standard(depend on 3G module)

Chapter 4 Electrical Parameter

ITEM		MIN	NORMAL	MAX
Power	Voltage	--	12V	--
	Ripple	--	--	50mV
	Current	3A		
Working parameter(HDMI screen only)	Work	--	200mA	600mA
	Standby	--	17mA	20mA
	USB Supply	--	--	500mA
LVDS	3.3V		400 mA	500 mA
	5V		550 mA	1A
	12V		580 mA	1A
	USB Supply	--	--	500mA
EDP	3.3V		400 mA	500 mA
	5V	--	--	--
	12V	--	--	--
	USB Supply	--	--	500mA
Total output	Current	3.3V		800mA
Static	Contact discharge			4KV
	Air discharge			8KV
Environment	Relative humidity	--	--	80%
	Operating temperature	-10℃	--	60℃
	Storage temperature	-20℃		70℃

Remark 1:

Please chose the right backlight working voltage(3.3V,5V) for LVDS screen. To prevent device burnout, please confirm LVDS screen's maximum working current before connect it to our motherboard.

Remark 2:

When connect motherboard to EDP/LVDS screen, motherboard's working voltage and current is depend on EDP/LVDS screen, therefore we didn't list those parameter on above list.

Chapter 5 Assembling Cautions

During assembling, please pay attention to notes below.

1. No short circuit between board and device;

2. Avoid motherboard bend or twist when mounted on user's device frame;

3. Confirm LVDS/EDP screen's requested voltage and current is correspond to motherboard output, mind the connector's pin definition and connect the pin correctly;

4. If backlight power requested is beyond 20W, please connect backlight to another power board;

5. When user mounting peripheral device(USB,IO etc), please mind the IO level and current output ;

6. When mounting serial port,pleas mind whether 232/485 device is connected and TX/RX pin connected correctly;

7. Check whether power input connected to input interface, make sure total input voltage and total input current suit user's request, please don't use backlight interface to supply power to other device.

Shenzhen Touch Thinking Intelligent Co., Ltd.

Tel: +86 755 23778483ext. 603

Fax: +86 7556664 2257 ext.811

E-mail: touchtec@sztouchtec.com

Add: the fourth building, Xinjianxing industrial park, Yangguang second road, Nanshan district, Shenzhen City, Guangdong Province, China

web