TouchFly

TouchFly Product Specification

Motherboard Series

JWS3399-MAIN-L

V1.2

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

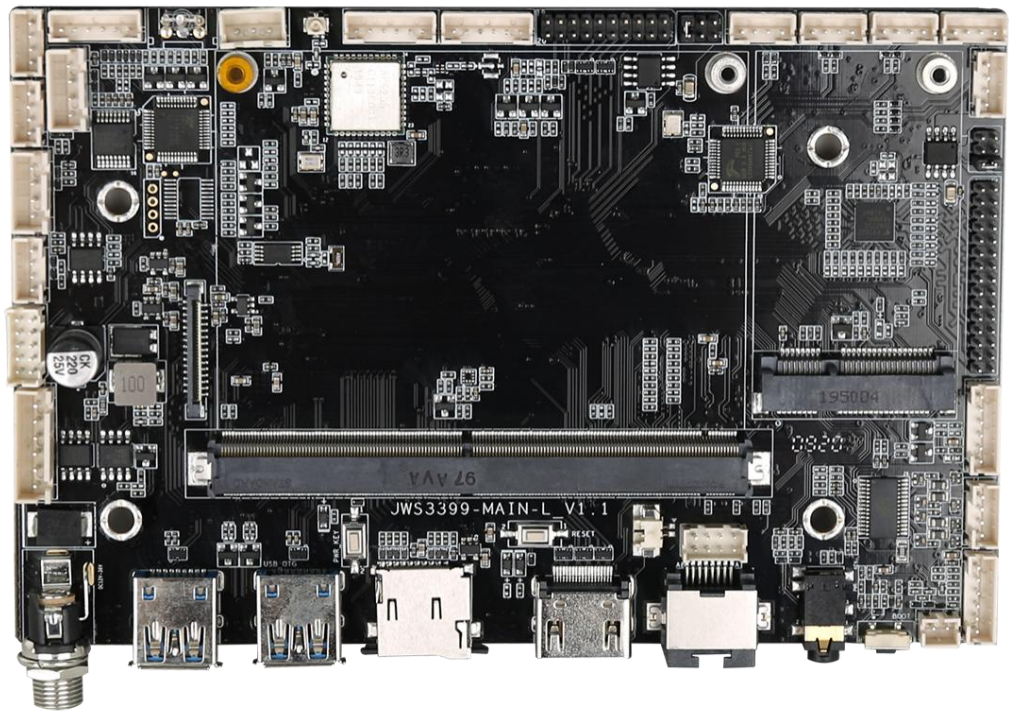
JWS3399-MAIN-L uses RK3399,a 64bit supper processor with dual-core Cortex-A72 and quad-core Cortex-A53,its basic frequency is 1.8GHz, JWS3399-MAIN-l Uses Mali-T860 GPU, it has H.265 hardware decoder to supports 4K display, Android7.1/9.0/11 OS are supported. JWS3399-MAIN-l integrate Dual-LVDS, EDP, HDMI display output interfaces to itself, with common backlight panel interface and screen level jumper, JWS3399-MAIN-L is compatible to various types of display screen.With powerful performance and fast process speed, JWS3399-MAIN-L is your best choice for human-computer interaction, intelligent terminal and industrialcontrol projects.

1.3 Features

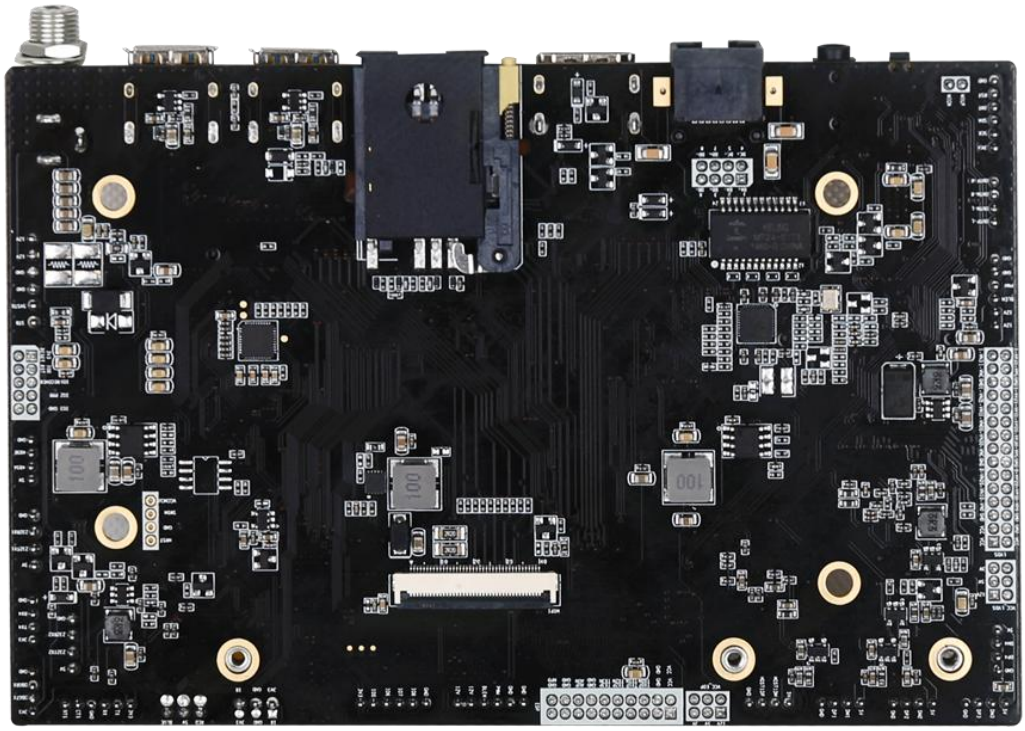
- Various display interfaces: Dual-LVDS, EDP, HDMI etc.
- Various expansion interfaces. JWS3399-MAIN-L has seven USB ports(Five internal expansion ports, two USB standard ports.), a 485 port, four expandable serial ports(TTL*2, one has hard flow control, RS232*2), a GPIO port and a ADC port,it can satisfy your customization request.
- Various internet interfaces:1000M Ethernet interface, 5G/2.4G WIIF supported, Independent dual-antenna, built-in PCI-E 3G/4G module interfaces.
- High definition.JWS3399-MAIN-L 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-MAIN-L provides system calling interface and API reference code, it supports upper-layer applications development perfectly.
- JWS3399-MAIN-L 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】



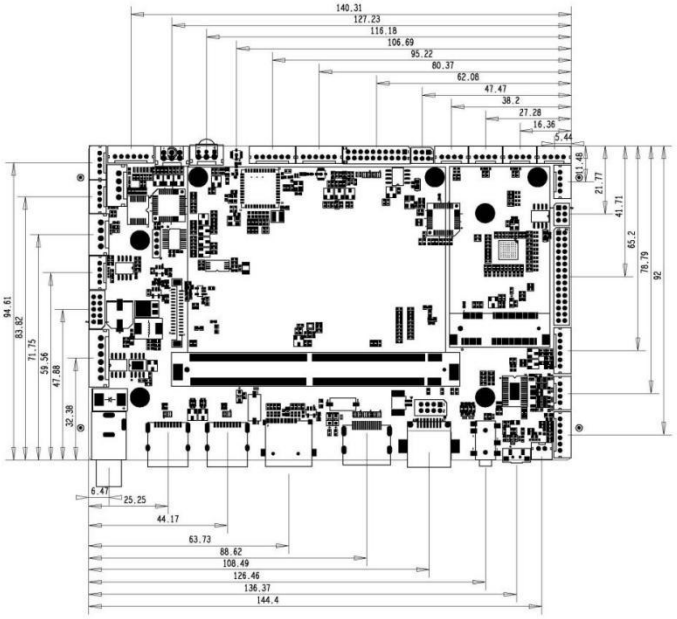
Chapter 2 Basic Informatio

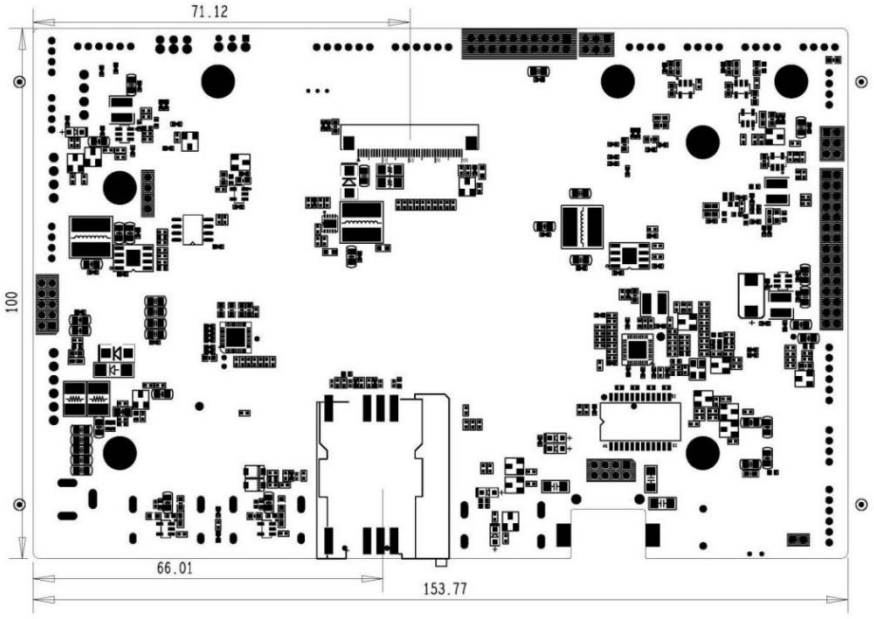
ITEM	Specifications
CPU	64Bit processor. Dual-core Cortex-A72 up to 1.8GHz Quad-core Cortex-A53 up to 1.4GHz Built-in low power consumption MCU Cortex-M0
GPU	Quad-core ARM Mali-T860MP4 GPU
Memory	4G(2G optional)
Storage	EMMC 32G(8/16/64G optional,maximum 64G)
ROM	4KB EEPROM
Resolution	Maximum 3840*2160
OS	Android7.1/9.0/11/linux4.4+QT Ubuntu18.04/Debian10.0
Play Mode	Supports multiple play modes such as loop,timing and interstitial.
Network	4G,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	USB standard*2,USB interface*5
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 single-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
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：153.77mm*100mm，Thickness :1.6mm

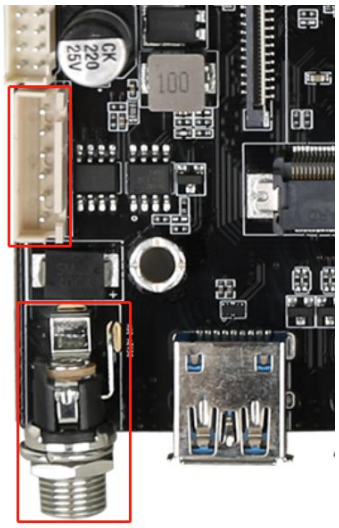
Screw hole size：∮4.2mm x 4

3.2 Interface Parameter Definition

◆ Power Input

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

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

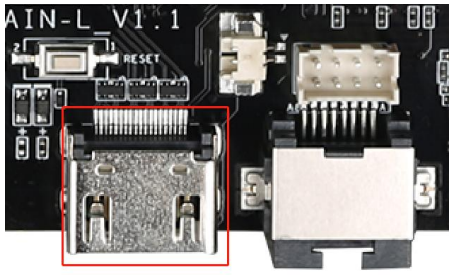


Interface definition as below list,user can apply power board input power supply, port have 6PIN and 2.54mm pin pitch.

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(disabled by default)
6	STB	I/O	Connect to MCU pin(disabled by default)

◆ RTC Battery

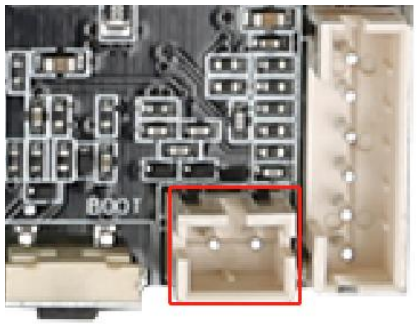
Supply power to OS clock when outside power is off.



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

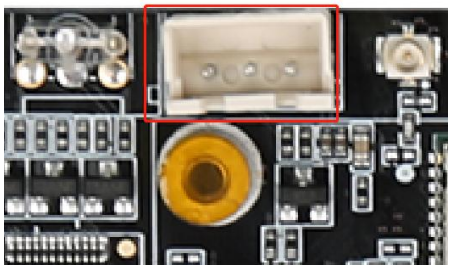
◆ MIC

Please mind MIC P/N poles.



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

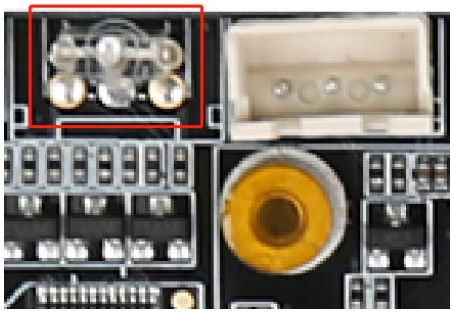
◆ Telecontrol



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

◆ Indicator

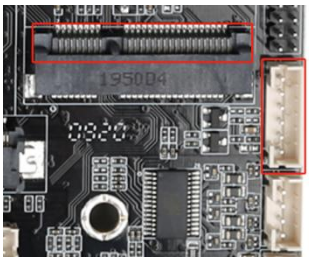
Default common anode RED/BLUE LED light.



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 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

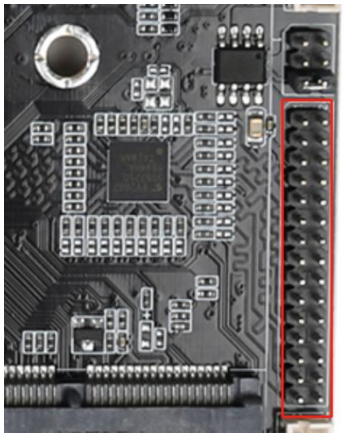
◆ LVDS Screen

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.

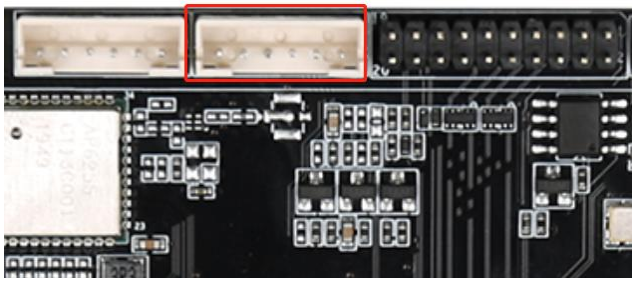


SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD power Output, +3.3v/+5V/+12V(Optional)
2			
3			
4	GND	GROUND	Ground
5			
6			
7	D0N	OUTPUT	Pixel0 Negative Data (Odd)
8	D0P	OUTPUT	Pixel0 Positive Data (Odd)
9	D1N	OUTPUT	Pixel1 Negative Data (Odd)
10	D1P	OUTPUT	Pixel1 Positive Data (Odd)
11	D2N	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 request other voltage, please add IO level-shift circuit.This port can only be used to supply backlight power, never connect it to other device as power input.

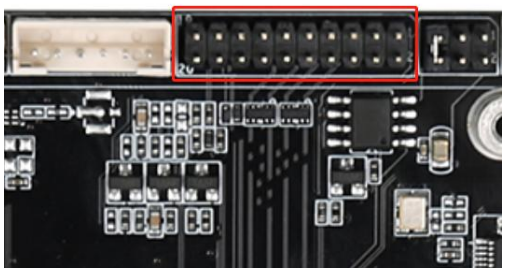


SN	Define	Property	Description
6	VCC	Power	12V Output
5	VCC	Power	12V Output
4	EN	OUTPUT	Backlight dis/enable control
3	PWM	OUTPUT	Backlight brightness control
2	GND	GROUND	Ground
1	GND	GROUND	Ground

◆ EDP Screen

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

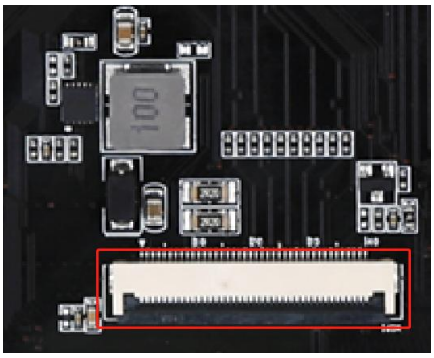
Please check the pin definition on board and cable, make sure pin on cable and motherboard is aligned(pin1 to pin1 for example).



SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD Power Output，+3.3V/+5V/+12V optional
2			
3	GND	GROUND	Ground
4			
5	TX0P	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	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

◆ MIPI

MIPI port supports single channel MIPI LCD, it also supports four channel MIPI interface with 1920*1200@60fps display.

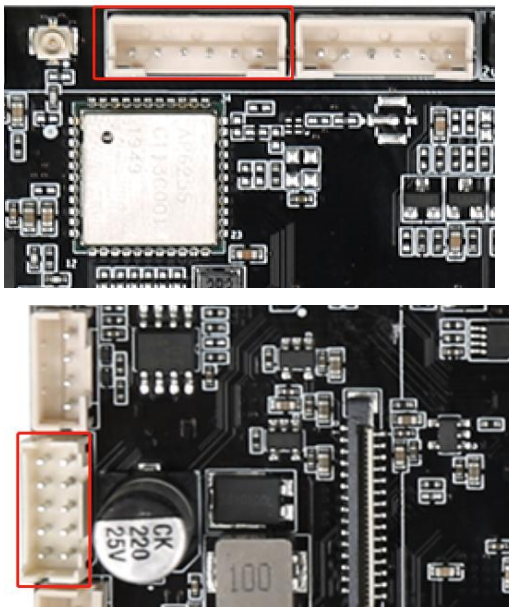


SN	Define	Property	Description
40	NC	-	Not connect
39	VDD	Power	Digital power
38	VDD	Power	Digital power
37	GND	GROUND	Ground
36	REST	OUTPUT	Global reset pin
35	NC	-	Not connect
34	GND	GROUND	Ground
33	D0N	OUTPUT	Negative MIPI differential data output
32	D0P	OUTPUT	Positive MIPI differential data output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

18	NC	-	Not connect
14	NC	-	Not connect
16	GND	GROUND	Ground
15	NC	-	Not connect
14	NC	-	Not connect
13	NC	-	Not connect
12	NC	-	Not connect
11	GND	GROUND	Ground
10	LED-	Power	LED Cathode
9	LED-	Power	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	LED Anode
1	LED+	Power	LED Anode

◆ IO

This port provides I/O control signal for peripheral devices, level is 3.3V, ADC signal can be used as button control. This port 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

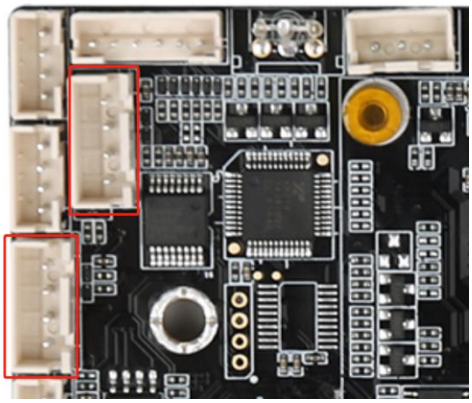
◆ 232 *2

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 port don’ t support TTL/485 device direct connect.

2.TX/RX pin must connect 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

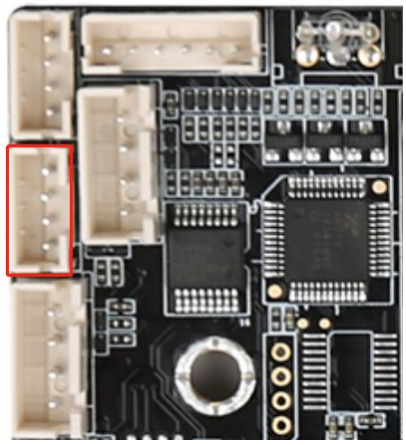
◆ TTL *2

Motherboard 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 require higher voltage, there must be an isolate circuit or level-shift circuit, otherwise motherboard and device might get burnout.

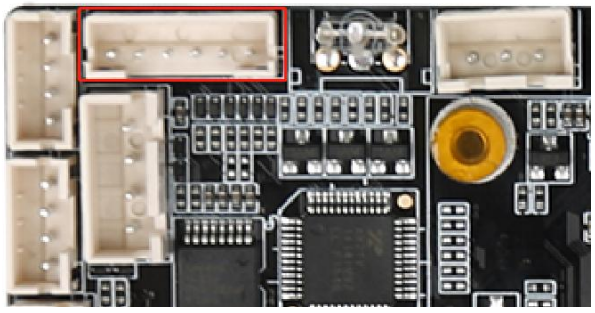
Note:

1.TTL serial port level must match with device’ s level, those port don’ t support MAX232/485 device direct connect.

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

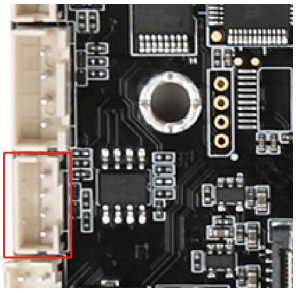


SN	Define	Property	Description
1	GND	GROUND	Ground
2	UART-RX	INPUT	RX
3	UART-TX	OUTPUT	TX
4	VCC	Power	3.3V Output



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 request higher voltage, there must be an isolate circuit or level-shift circuit, otherwise motherboard and device might get burnout.

Note:

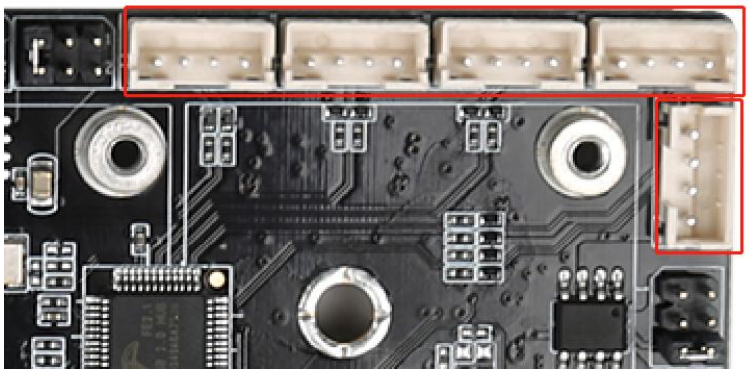
1.485 serial port level must match with device′ s level.

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

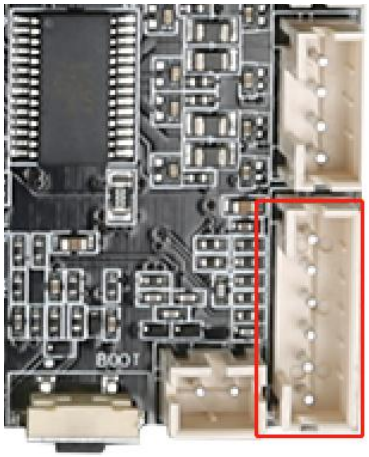
◆ USB

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



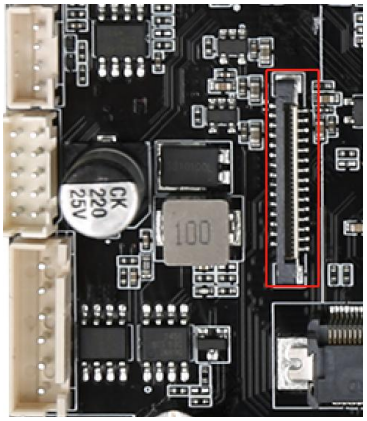
SN	Define	Property	Description
1	VCC	Power	5V Output
2	DM	INPUT/OUTPUT	DM
3	DP	INPUT/OUTPUT	DP
4	GND	GROUND	Ground

◆ 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

◆ Camera_IN

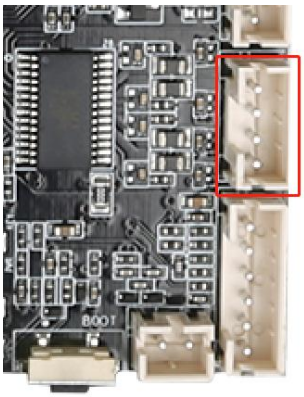


Motherboard can supports MIPI cameras with maximum 1300W pixels, the electrical definition as below:

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_SDA	INPUT/OUTP	SDA Signal
10	I2C3_SCL	OUTPUT	SCL Signal
11	RST	OUTPUT	Reset Signal
12	PWDN	OUTPUT	Power Down Signal
13	GND	GROUND	Ground

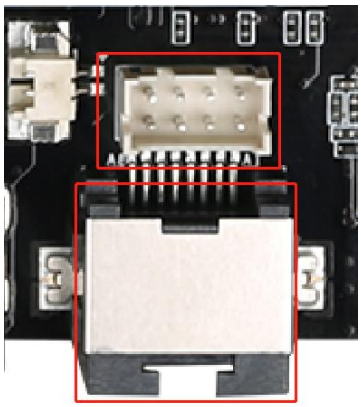
14	MCLK	OUTPUT	Main Clock
15	GND	GROUND	Ground
16	D3P	INPUT/OUTP	MIPI Data Channel 3 Positive
17	D3N	INPUT/OUTP	MIPI Data Channel 3 Negative
18	GND	GROUND	Ground
19	D2P	INPUT/OUTP	MIPI Data Channel 2 Positive
20	D2N	INPUT/OUTP	MIPI Data Channel 2 Negative
21	GND	GROUND	Ground
22	D1P	INPUT/OUTP	MIPI Data 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



Motherboard supports 1000M Ethernet port, there is two net ports(RJ45 and 8Pin interface), but user can only chose one connector, two ports can’ t work together.

◆ 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	36V
	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.