TouchFly

TouchFly Product Specification

Motherboard Series

JWS3288-G

V1.1

Chapter 1 Introduction

1.1 Applicability

JWS3288-G is a intelligent terminal motherboard with large temperature endurance range. It's designed for medical industry , all parts included processor is industry grade, the temperature endurance range is -20°to +70°.

1.2 Functions

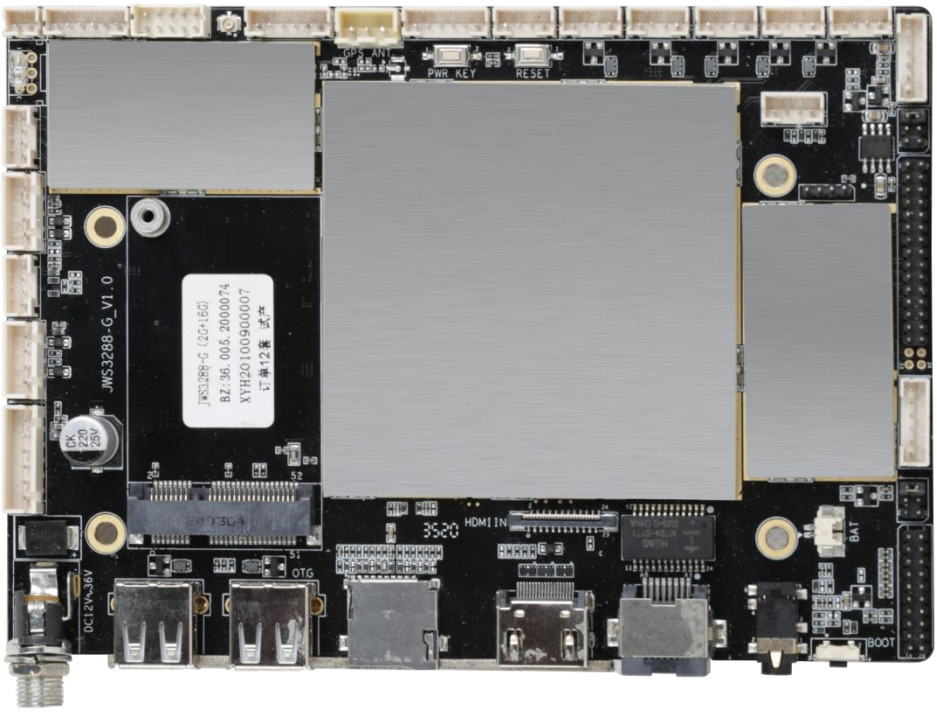
JWS3288-G uses RK3288/RK3288K Cortex-A17 quad-core processor, basic frequency is 1.6GHz. JWS3288-G Uses Mali-T764 GPU, it has H.265 hardware decoder to supports 4K display. Whether it is games, test performance scores or decoding, JWS3288-G is your best choice for human-computer interaction and medical industry projects.

1.3 Features

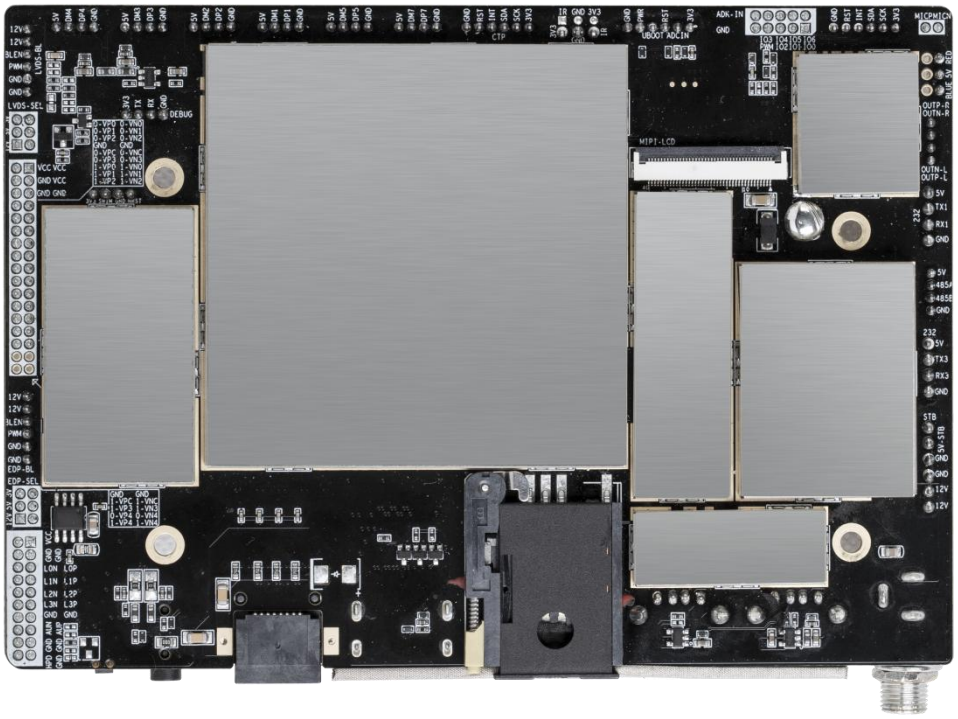
- High integration, JWS3288-G integrated LVDS/EDP/Ethernet/HDMI/WIFI/Blue tooth functions.
- Built-in PCI-E 3G module. JWS3288-I Supports PCIE 3G/4G module from HUAWEI,ZTE or other brand, it also supports VoLTE.
- Various expansion interfaces. JWS3288-G has 8 USB ports(6 internal expansion ports and 2 USB standard ports.), two 232 ports and a 485 port, it can satisfy your customization requirement.
- High definition.JWS3288-G supports 4K 3840x2160 decoding and LCD display with various LVDS/EDP interfaces, it also supports Special-shaped screens of various sizes and resolutions.
- Support Android system customization. JWS3288-G provides system calling interface and API reference code, it supports development of upper-layer applications perfectly.
- JWS3288-G 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】

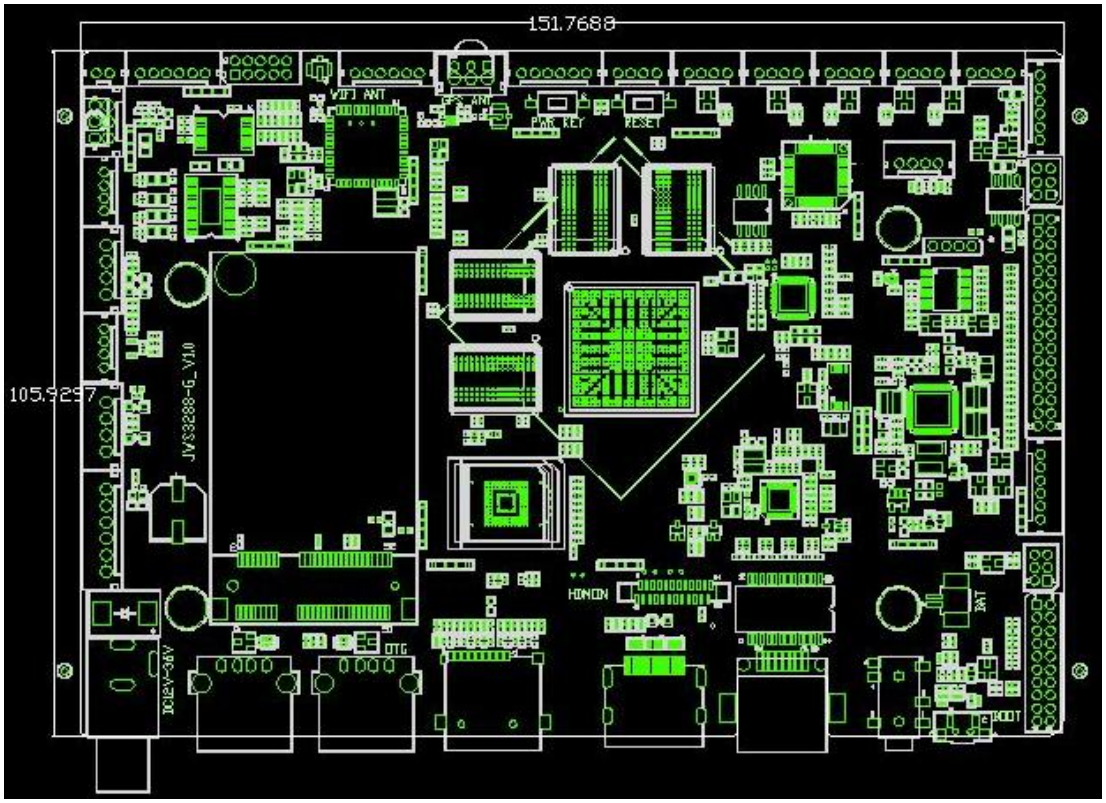


Chapter 2 Basic Informatio

Specifications	
CPU	RK3288, Quad-core, 1.6GHz
Memory	2G(4G optional)
Storage	EMMC 16G(8/32/64G optional,maximum 64G)
ROM	4KB EEPROM
Resolution	Maximum 3840*2160
OS	Android 7.1/10.0
Play Mode	Supports multiple play modes such as loop,timing and interstitial.
Network	4G,Ethernet,WiFi/BT4.0,Wireless peripheral extension
Video Format	Support WMV,AVI,FLV,RM,RMVB,MPEG,TS,MP4 etc
Photograph Format	Support BMP,JPEG,PNG,GIF
USB	USB HOST*2,USB interface*6
Serial Port	232*2，485*1
GPS	External GPS(Optional)
WIFI、BT	Built-in WIFI，BT4.0
4G	Unlocked,Support voice call(base on 4G module,Optional)
Ethernet	10M/100M/1000M adapt Ethernet
TF Card	Trans flash Card supported
LVDS	LVDS*1,support 50/60Hz LCD panel
EDP	Support Multi-resolution EDP interface LCD panel
HDMI	HDMI*1, support 1080P@120Hz，4kx2k@60Hz output
AV Output	Built-in dual 4Ω/20W，8Ω/10W amplifier
Real Time Clock	Supported
Timing turn on/off	Supported
OS upgrade	Support upgrade through TF,USB

Chapter 3 PCB And Interface

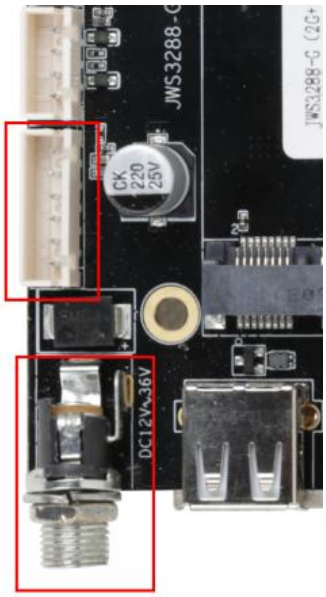
3.1 PCB Drawing



3.2 Interface Parameter Definition

◆ Power Input

12V DC power supply, motherboard can only uses power input from DC port or power input port.

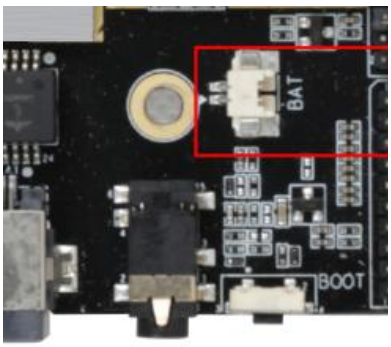


SN	DEFN	Property	Description
1	VCC	INPUT	12V Input
2	VCC	INPUT	12V Input
3	GND	GROUND	Ground
4	GND	GROUND	Ground
5	5V-STB	INPUT	5V Input(default is disable)
6	STB	I/O	Connect to MCU pin

5V-STB and STB(I/O) are designed for power board standby function, if customer need low-power consumption standby, connect 5V-STB(JWS3288-G) to 5V-STB(Power board) and connect STB(Output) to PS_ON(Power board),please notice that different brand of power board might have difference on define of those two pin,please refer to actual conditions. If this function is not needed, user can disconnect those two pins(in this situation motherboard will disable standby function).

◆ RTC Battery

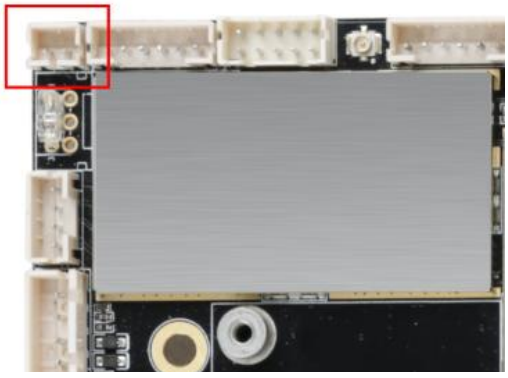
Supply power to OS clock when peripheral power is disconnect.



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

◆ MIC

Please mind MIC P/N poles.



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

◆ Telecontrol

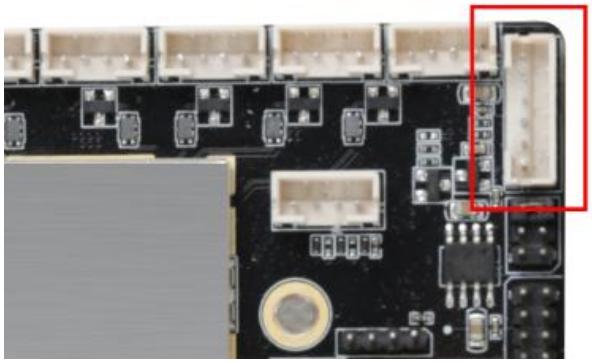
SN	DEFN	Property	Description
1	IR	INPUT	Telecontrol signal Input
2	GND	GROUND	Ground
3	3V3	Power	3.3V Output

◆ Indicator

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

◆ 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 defect, 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	DEFN	Property	Description
1	GND	GROUND	Ground
2	GND	GROUND	Ground
3	BL_ADJ	OUTPUT	Backlight brightness control
4	BL_EN	OUTPUT	Backlight dis/enable control
5	VCC	Power	12V Output
6	VCC	Power	12V Output

◆ LVDS Screen Panel Port

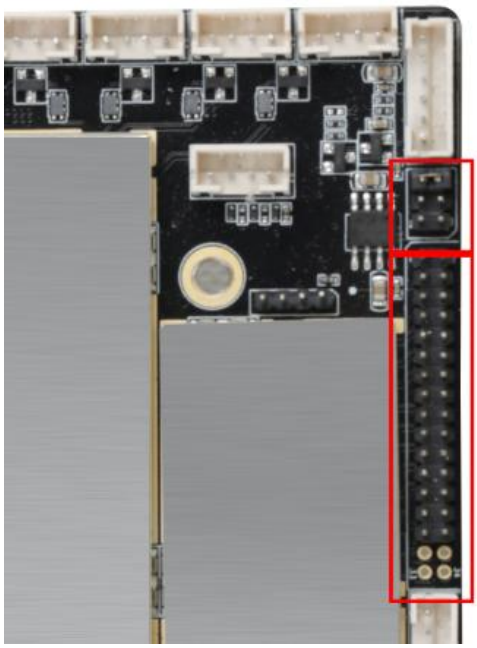
Common LVDS pin definition, support single/dual, 6/8bit LVDS panel, user can change port voltage level by move jumper cap position, 3.3V/5V/12V is optional.

To prevent board 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.

3.When you connect 6/8bit LVDS screen, make sure pin on cable and board is aligned(pin1 to pin1 for example).

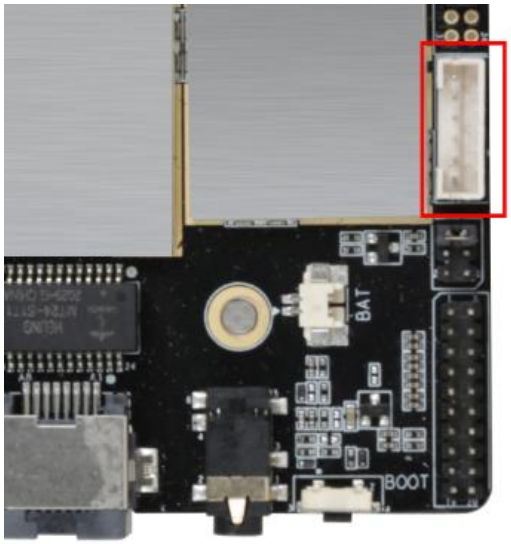


SN	DEFN	Property	Description
1	VCC	Power OUTPUT	LCD power Output, +3.3v/+5V/+12V(optional)
2			
3			
4	GND	GROUND	Ground
5			
6			
7	D0N	OUTPUT	Pixel0 Negative Data (Odd)
8	D0P	OUTPUT	Pixel0 Positive Data (Odd)
9	D1N	OUTPUT	Pixel1 Negative Data (Odd)
10	D1P	OUTPUT	Pixel1 Positive Data (Odd)
11	D2N	OUTPUT	Pixel2 Negative Data (Odd)
12	D2P	OUTPUT	Pixel2 Positive Data (Odd)
13	GND	GROUND	Ground
14	GND	GROUND	Ground
15	CL0N	OUTPUT	Negative Sampling Clock (Odd)
16	CL0P	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	CL1N	OUTPUT	Negative Sampling Clock (Even)
28	CL1P	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 another power panel.Backlight dis/enable controller voltage is 5V, if EDP screen request 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.

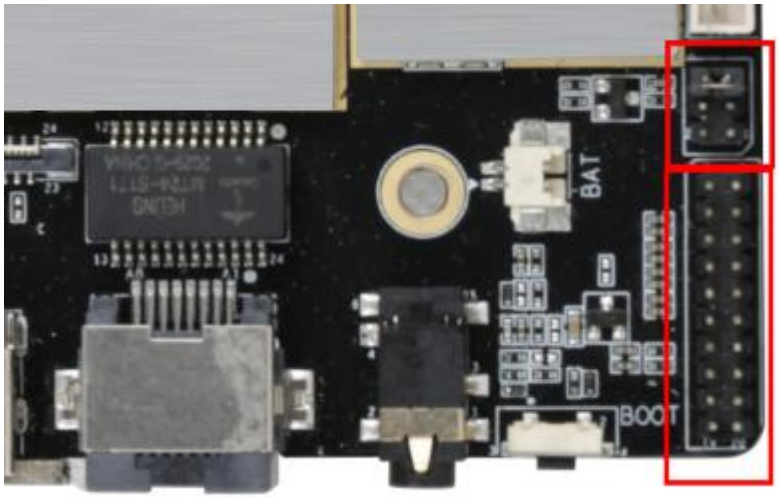


SN	DEFN	Property	Description
6	VCC	Power	12V Output
5	VCC	Power	12V Output
4	EN	OUTPUT	Backlight dis/enable control
3	PWM	OUTPUT	Backlight brightness control
2	GND	GROUND	Ground
1	GND	GROUND	Ground

◆ EDP

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

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

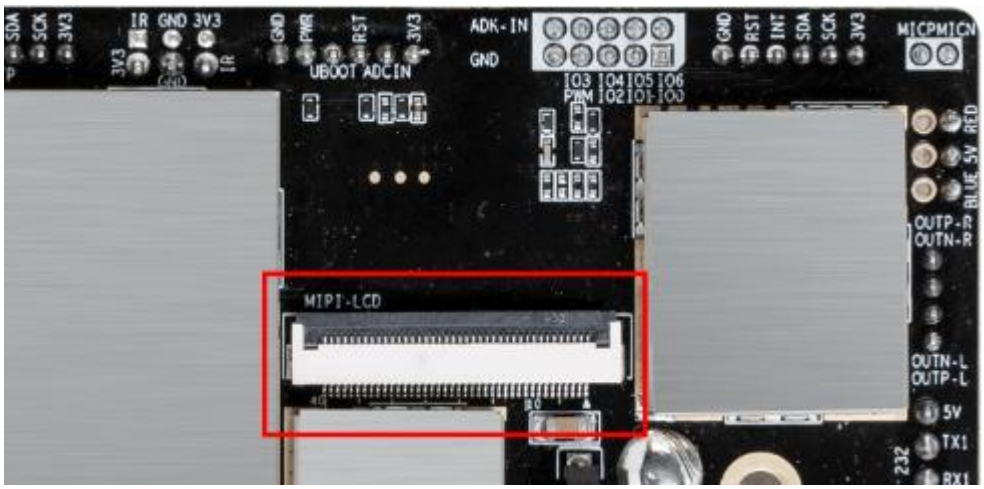


SN	DEFN	Property	Description
1	VCC	Power OUTPUT	LCD Power Output，+3.3V/+5V/+12V optional
2			
3	GND	GROUND	Ground
4			
5	TX0P	OUTPUT	EDP Pixel0 Positive Data (Odd)
6	TX0N	OUTPUT	EDP Pixel0 Negative Data (Odd)
7	TX1P	OUTPUT	EDP Pixel1 Positive Data (Odd)
8	TX1N	OUTPUT	EDP Pixel1 Negative Data (Odd)

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 support single channel MIPI LCD screen, the maximum resolution and frequency for 4 channels is 1920*1200@60fps.



SN	DEFN	Property	Description
1	NC	-	Not connect
2	VDD	Power	Digital power
3	VDD	Power	Digital power
4	GND	GROUND	Ground
5	REST	OUTPUT	Global reset pin
6	NC	-	Not connect
7	GND	GROUND	Ground
8	D0N	OUTPUT	Negative MIPI differential data output
9	D0P	OUTPUT	Positive MIPI differential data output
10	GND	GROUND	Ground
11	D1N	OUTPUT	Negative MIPI differential data output
12	D1P	OUTPUT	Positive MIPI differential data output
13	GND	GROUND	Ground
14	CLKN	OUTPUT	Negative MIPI differential data output
15	CLKP	OUTPUT	Positive MIPI differential data output
16	GND	GROUND	Ground
17	D2N	OUTPUT	Negative MIPI differential data output
18	D2P	OUTPUT	Positive MIPI differential data output
19	GND	GROUND	Ground
20	D3N	OUTPUT	Negative MIPI differential data output
21	D3P	OUTPUT	Positive MIPI differential data output
22	GND	GROUND	Ground
23	NC	-	Not connect
24	NC	-	Not connect
25	GND	GROUND	Ground
26	NC	-	Not connect
27	NC	-	Not connect
28	NC	-	Not connect
29	NC	-	Not connect
30	GND	GROUND	Ground
31	LED-	Power	LED Cathode
32	LED-	Power	LED Cathode
33	NC	-	Not connect
34	NC	-	Not connect

35	NC	-	Not connect
36	NC	-	Not connect
37	NC	-	Not connect
38	NC	-	Not connect
39	LED+	Power	LED Anode
40	LED+	Power	LED Anode

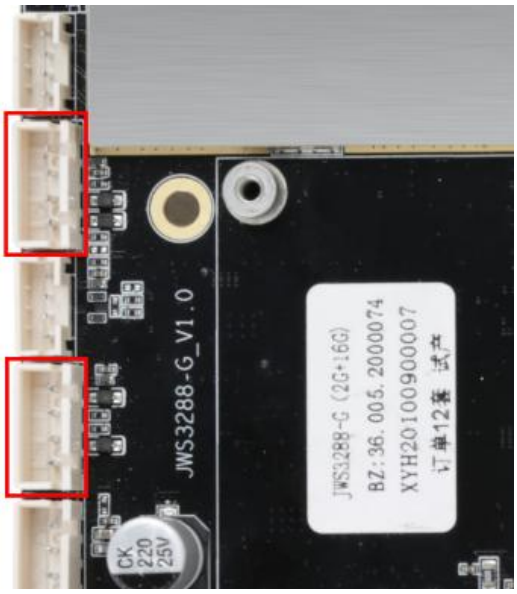
◆ 232 *2

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

Note:

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

2.TX/RX pin must connect to cable TX/RX pin correctly.



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

◆ RS485*1

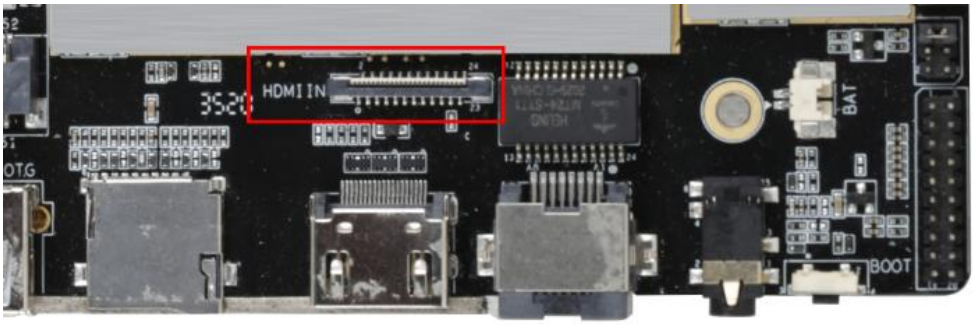
To prevent motherboard and screen panel burning-out, please notice below:

1.Confirm MIPI LCD electrical parameter in SPEC is correct and its request is in consonance with board power supply.

2.Please confirm pin definition on board and screen interface is the same, make sure FPC cable is correct.

SN	DEFN	Property	Description
1	GND	GROUND	Ground
2	485B	DIF	Differential B
3	485A	DIF	Differential A
4	VCC	Power	5V Output

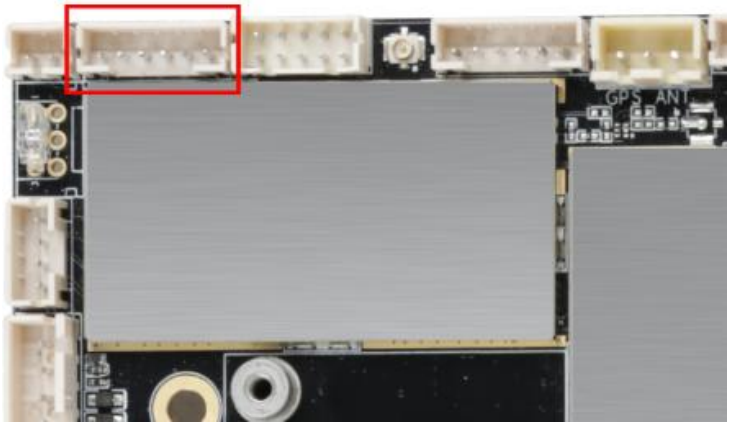
◆ HDMI IN



SN	DEFN	Property	Description
1	VCC	Power	5V Output
2	PWREN	OUTPUT	Power dis/enable
3	GND	GROUND	Ground
4	GND	GROUND	Ground
5	D0N	INPUT/OUT	MIPI Data Channel 0 Negative
6	D0P	INPUT/OUT	MIPI Data Channel 0 Positive
7	D1N	INPUT/OUT	MIPI Data Channel 1 Negative
8	D1P	INPUT/OUT	MIPI Data Channel 1 Positive
9	D2N	INPUT/OUT	MIPI Data Channel 2 Negative
10	D2P	INPUT/OUT	MIPI Data Channel 2 Positive
11	D3N	INPUT/OUT	MIPI Data Channel 3 Negative
12	D3P	INPUT/OUT	MIPI Data Channel 3 Positive
13	CLKN	INPUT/OUT	MIPI Clock Channel Negative
14	CLKP	INPUT/OUT	MIPI Clock Channel Positive
15	INT	INPUT	Interrupt
16	STBY	OUTPUT	Standby control
17	IR	INPUT	Undetermined
18	RST	OUTPUT	Reset Signal
19	NC	NC	NC
20	NC	NC	NC
21	NC	NC	NC
22	NC	NC	NC
23	I2C4_SDA	INPUT/OUT	SDA signal
24	I2C4_SCL	OUTPUT	SCL signal

◆ IIC Switch Port

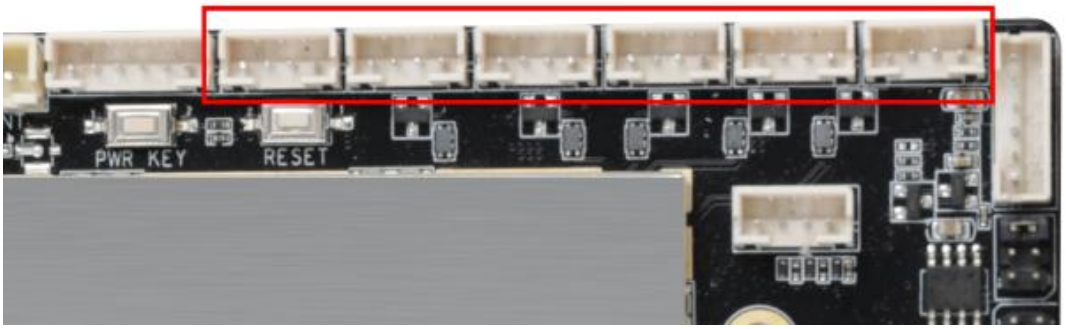
With a transform board from our company, I2C switch port can transform to TTL serial port or 8 channel GPIO port. It is designed for situations that lack of TTL/GPIO output.

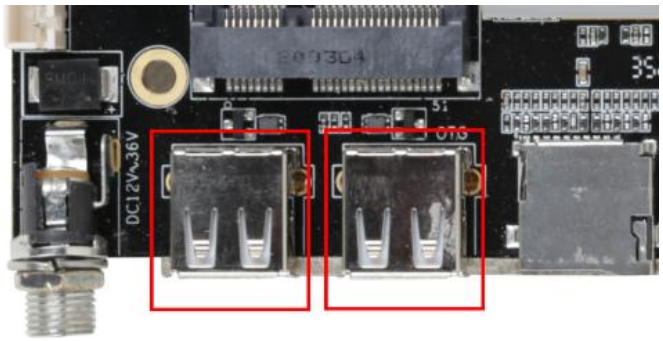


SN	DEFN	Property	Description
1	VCC	Power	3.3V Output
2	SCK	INPUT/OUTPUT	I2C Clock
3	SDA	INPUT/OUTPUT	I2C Data
4	INT	INPUT/OUTPUT	Interrupt
5	RST	INPUT/OUTPUT	Reset
6	GND	GROUND	Ground

◆ USB

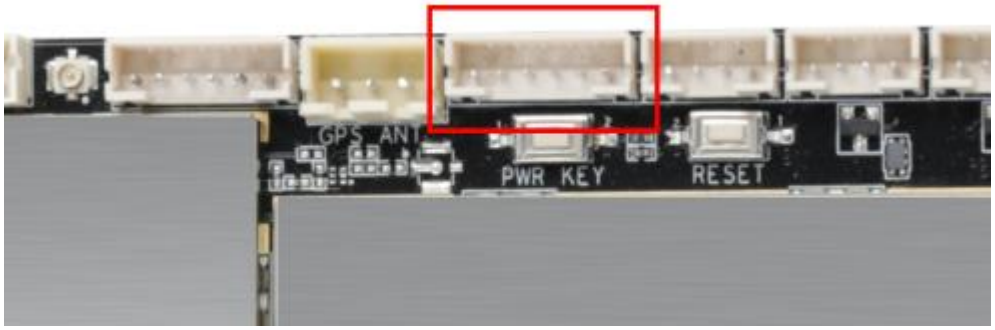
Motherboard provides 2 Host USB standard ports(host*1,OTG*1), and 6 internal USB ports.





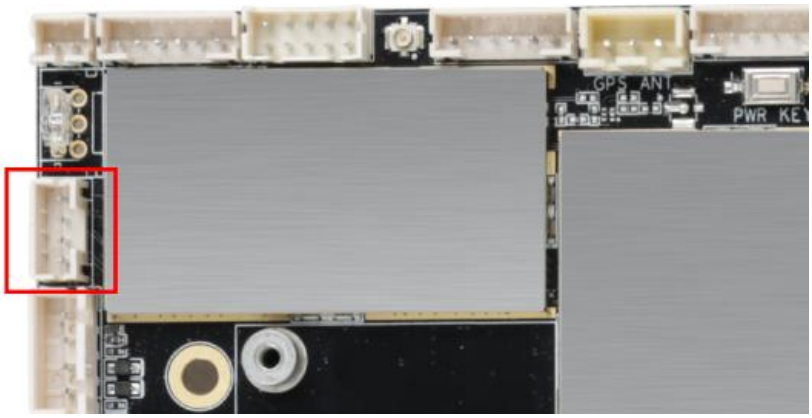
SN	DEFN	Property	Description
1	VCC	Power	5V Output
2	DM	INPUT/OUTPUT	DM
3	DP	INPUT/OUTPUT	DP
4	GND	GROUND	Ground

◆ Touch Screen(TP)



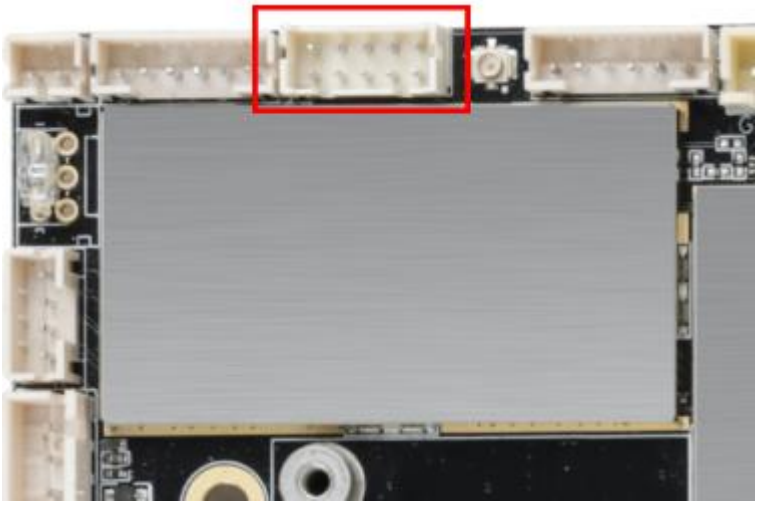
SN	DEFN	Property	Description
1	VCC	Power	3.3V Output
2	SCL	INPUT/OU	I2C Clock
3	SDA	INPUT/OU	I2C Data
4	INT	INPUT/OU	Interrupt
5	RST	INPUT/OU	Reset
6	GND	GROUND	Ground

◆ Speaker



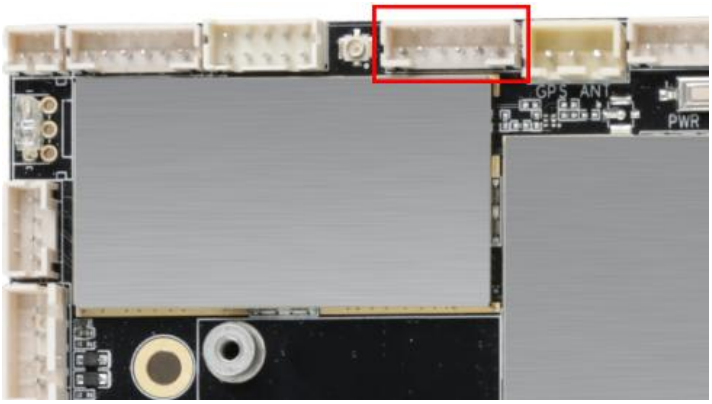
SN	DEFN	Property	Description
1	RP	OUTPUT	Audio Output Right+
2	RN	OUTPUT	Audio Output Right-
3	LN	OUTPUT	Audio Output Left-
4	LP	OUTPUT	Audio Output Left+

◆ GPIO



SN	DEFN	Property	Description
1	GPIO0_B5	INPUT/OUTPUT	IO Port
2	GPIO0_B1	INPUT/OUTPUT	IO Port
3	GPIO0_A1	INPUT/OUTPUT	IO Port
4	GPIO0_A7	INPUT/OUTPUT	IO Port
5	GPIO6_A5	INPUT/OUTPUT	IO Port
6	GPIO7_A4	INPUT/OUTPUT	IO Port
7	MIPI_BL_PWM	NC	NC
8	GPIO6_A6	INPUT/OUTPUT	IO Port
9	GND	GROUND	Ground
10	ADC_IN	INPUT	ADC Signal

◆ Button



SN	DEFN	Property	Description
1	VCC	Power	5V Output
2	ADC	INPUT	ADC Signal
3	RST	INPUT	Reset Signal
4	UBOOT	INPUT	Connect To A Upgrade Button
5	PWR_ON	INPUT	Connect To A Power Button
6	GND	GROUND	Ground

◆ 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 1000M wired internet
HDMI	Standard	Support HDMI data output, maximum definition 4K
Audio	Standard	3.5mm standard interface
4G	PCI-E Standard	Support HUAWEI,ZTE or other brand’s PCI-E 3G/4G module
SIM	Standard	Support all standard(depend on 4G module)

Chapter 4 Electrical Parameter

ITEM		MIN	NORMAL	MAX
Power	Voltage	--	12V	--
	Ripple	--	--	50mV
	Current	3A		
Working parameter(HDMI screen only)	Work	--	200mA	350mA
	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
Environment	Relative humidity	--	--	80%
	Operating 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.