Product Specification

Mainboard series

CX-3568-A

V1.0

CONTENTS

Chapter 1 Introduction

1.1 Applicability

CX3568-A is a 22nm advanced manufacturing process android series product with high performance, low power consumption feature. It has a quad-core 64-bit Cortex-A55 core architecture with a 2.0GHz basic frequency; Built-in independent NPU, with 1TOPS AI computing power, support lightweight AI application development, GPU using ARM Mali-G52 2EE，it supports 4K video decode and 4K display output.

1.2 Functions

CX3568-A uses Android12 OS. It integrated double LVDS, eDP, MIPI, HDMI display output interfaces, MIPI Camera, SATA hard disk, gigabit network etc, and it has built-in universal backlight board port and screen voltage select jumper, compatible with various kinds of display; Stronger performance, faster, richer interface, CX3568-A is your best choice for human-computer interaction, intelligent terminal, industrial control projects.

1.3 Features

- Various display interfaces: Dual-LVDS, EDP, HDMI etc.

- Various expansion interfaces. CX3568-A has six USB ports(A USB3.0 HOST standard port,a USB3.0 OTG standard port, four internal expansion ports, there expansion ports from USB_HUB, one from CPU),two TTL serial ports, two RS232 serial ports, a 485 port, a 12I/O channel GPIO port ,it can satisfy your customization request.

- Various internet interfaces:a 1000M Ethernet interface, 2.4G WIIF and BT5.2 supported,built-in PCI-E 4G module interfaces.

- High definition.CX3568-A supports 4K/60HZ output, it also supports display screen with LVDS/EDP/MIPI/HDMI interface.

- Android system customization. CX3568-A provides system calling interface and API reference code, it supports upper-layer applications development perfectly.

- CX3568-A supports infrared, optical, capacitance, resistance and other mainstream touch screen.

1.4 Front/Back Side Picture

【Front】

【Back】

【Port position】

（PH2.0-3P）　（PH2.0-6P）　　　　　　（PH2.0-4P）

SATA　　　IR　LVDS BL POWER　TP　　TTL (TTYS4)　TTL (TTYS3)　CAN　　USB　232 (TTYS8)　232 (TTYS9)

（XH2.54-4P）
SATA POWER

（PH2.0-4P）
DEBUG

（PH2.0-6P）
EDP BL POWER

（PHD2.0-2*5P）
GPIO

（XH2.54-4P）
POWER IN 12V-36V

485 (TTYS7)
USB
USB
USB　　（PH2.0-4P）
SPK

MIC
（PH2.0-2P）
Headphone R/L
（PH2.0-4P）

DC IN 12V-36V

USB 3.0 HOST　USB3.0 OTG　TF　　HDMI OUT　　RJ45　Headphone
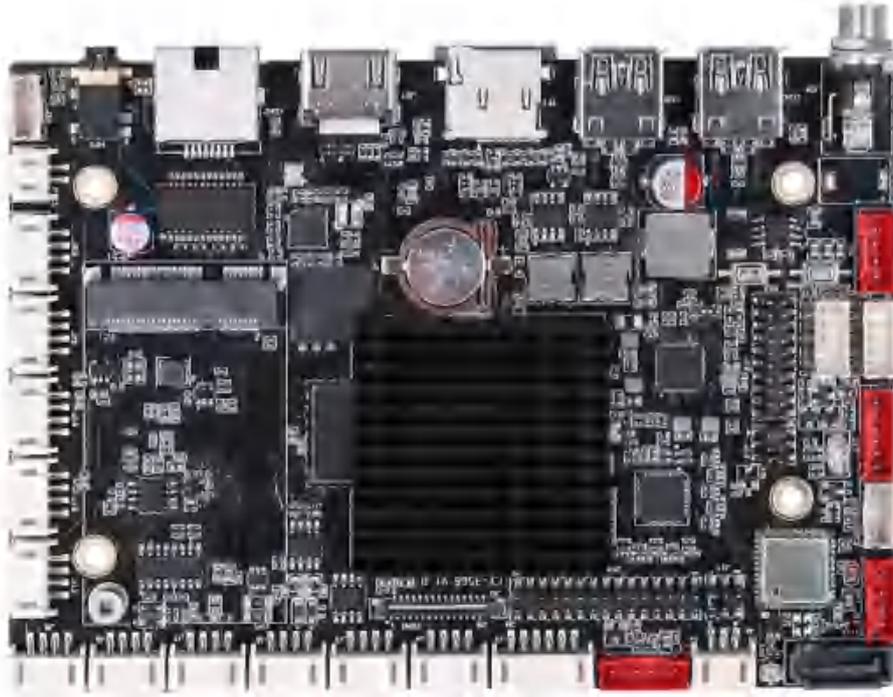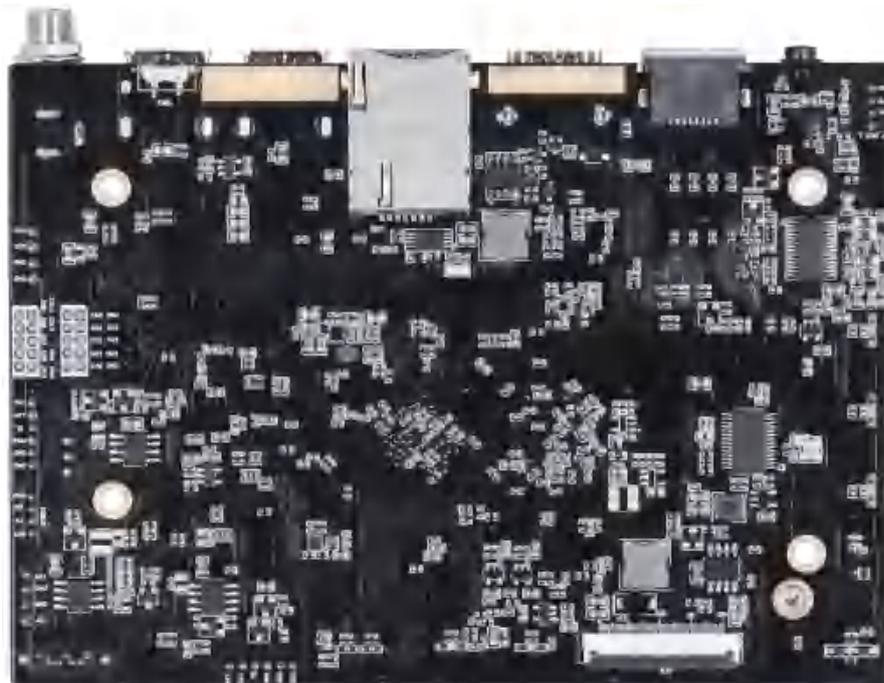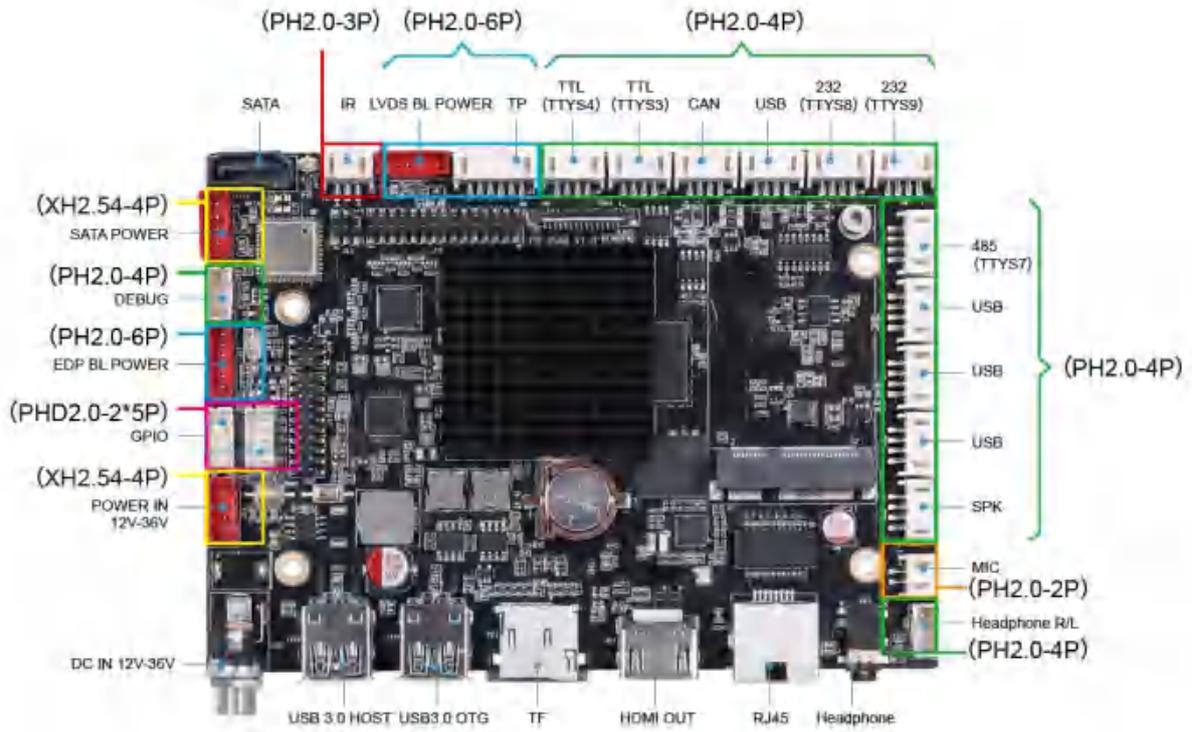
Chapter 2 Basic Informatio

ITEM	Specifications
CPU	64Bit processor
GPU	ARM Mali-G52 2EE GPU
Memory	2GB LPDDR4
Storage	EMMC 32GB
ROM	4KB EEPROM
Resolution	4K/60Hz
NPU	Built-in NPU with 1TOPS AI computing power
OS	Android12/14/Linux5.10/Ubuntu20.04/Ubuntu22.04/Debian11
Play Mode	Supports multiple play modes such as loop,timing and
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	USB3.0*2(HOST*1,OTG*1)
Mipi Camera	30pin FPC interface, 1300w Camera supported
Serial Port	RS232*2,485*1,TTL*2,CAN port*1
GPS	External GPS(Optional)
SATA	SATA socket*1
WIFI、BT	Built-in 2.4G WIFI, BT5.2
4G	Built-in MINIPCIE 4G module socket
Ethernet	1000M*1
TF	Trans flash Card supported
LVDS	Dual-channel LVDS port*1
eDP	x4 eDP port*1
HDMI	Standard HDMI2.0 port
MIPI	A MIPI LCD port(40 pins FPC socket)
AV Output	Built-in dual channel AV output,amplifier support 4R/10W per
Earphone Port	Built-in 3.5mm 4-pole port
Real Time Clock	Supported
Timing turn on/off	Supported (a RJ45 port for remote startup control)

Chapter 3 PCB And Interface

3.1 PCB Drawing
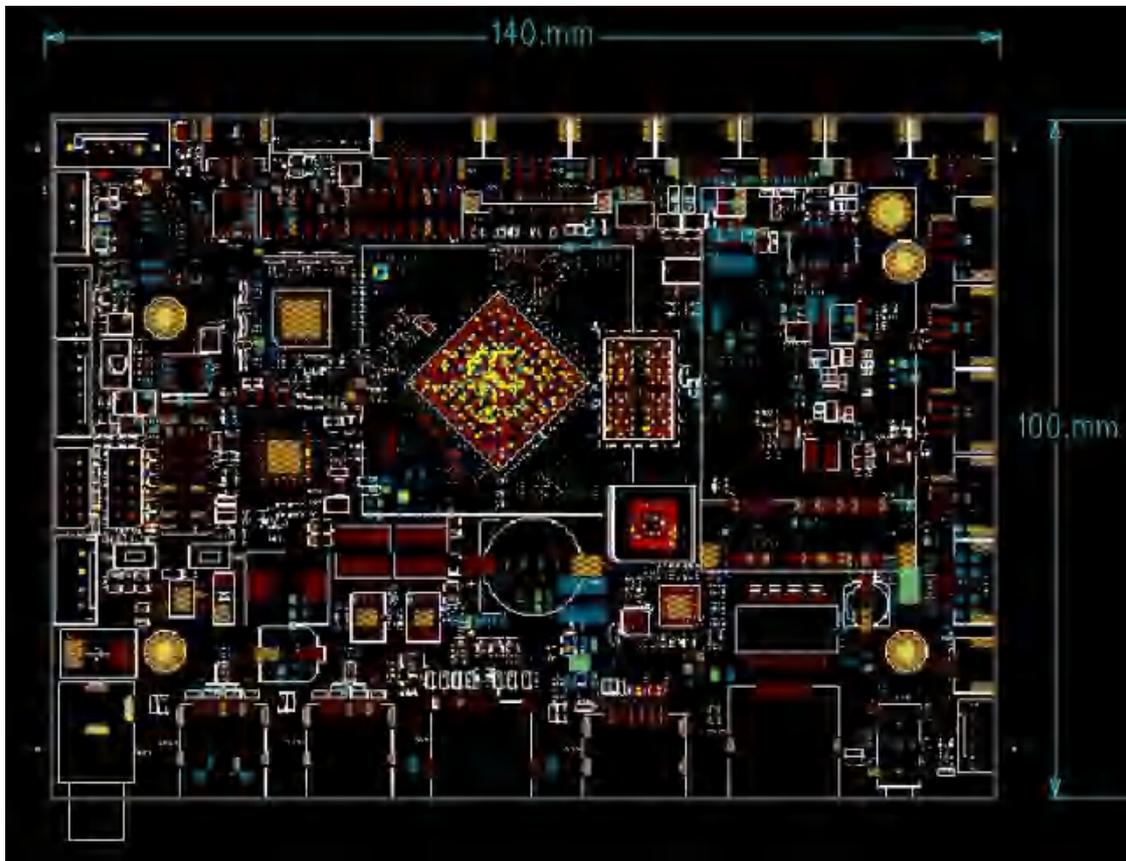
Size：140mm*100mm，Thickness :1.6mm

3.2 Interface Parameter Definition

◆ **Power Input**

12V-36 DC power supply, motherboard can only apply power input from DC interface and power interface, the adaptor DC input connector SPEC is d2.0.

When motherboard is under idling state, the minimum current 12V DC power supported is 2A.
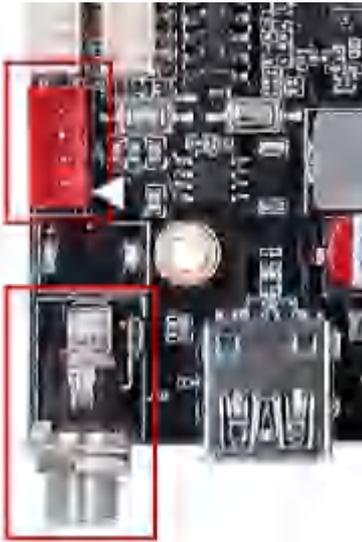
Interface definition as below list, motherboard can apply power board input power supply, port have 4PIN and 2.54mm pin pitch.

SN	Define	Property	Description
1	VCC	INPUT	12V-36V Input
2	VCC	INPUT	12V-36V Input
3	GND	GROUND	Ground
4	GND	GROUND	Ground

◆ RTC Battery

Button cellCR1220

Supply power to OS clock when outside power is off.
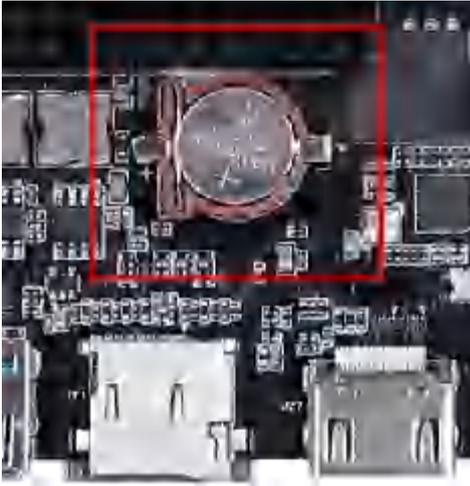
◆ MIC

Please mind MIC P/N poles.
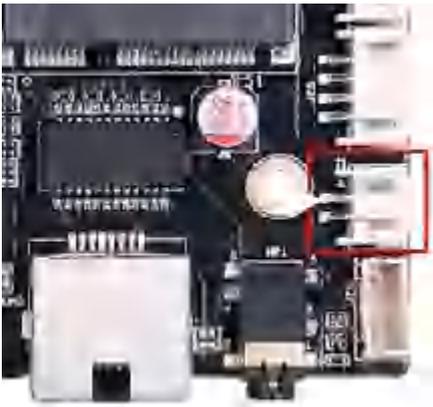
SN	Define	Property	Description
1	MICN	INPUT	MIC-
2	MICNP	INPUT	MIC+

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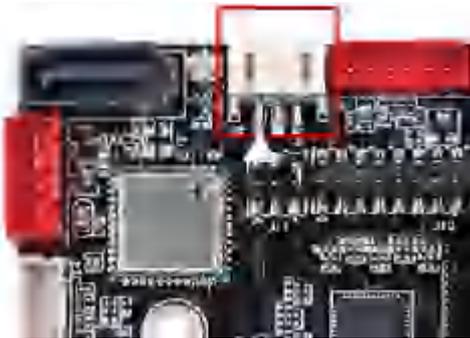
SN	Define	Property	Description
1	IR	INPUT	Telecontrol signal Input
2	GND	GROUND	Ground
3	3V3	Power	3.3V Output

◆ Indicator

Default common anode RED/BLUE LED light.
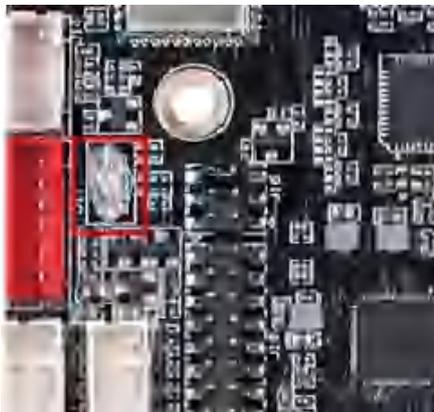
SN	Define	Property	Description
1	LED_B	Blue	Work state indicator
2	VCC	Power	3.3V Output
3	LED_R	Red	Standby state indicator

◆ LVDS Backlight Control Port

This port is designed for LVDS panel′s backlight control function, the current of 12V power supply is less than 1.5A, when connect a 19inch or lager LCD panel, or if screen backlight power beyond 20W, in order to prevent system unstable, please connect backlight cable to other power panel. If LCD panel needs other electrical level, 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.
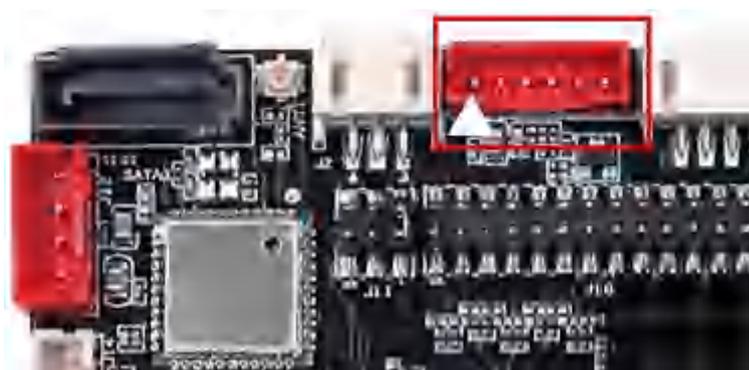
SN	Define	Property	Description
1	VCC	Power	12V Output
2	VCC	Power	12V Output
3	EN	OUTPUT	Backlight dis/enable control
4	PWM	OUTPUT	Backlight brightness control
5	GND	GROUND	Ground
6	GND	GROUND	Ground

◆ 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.
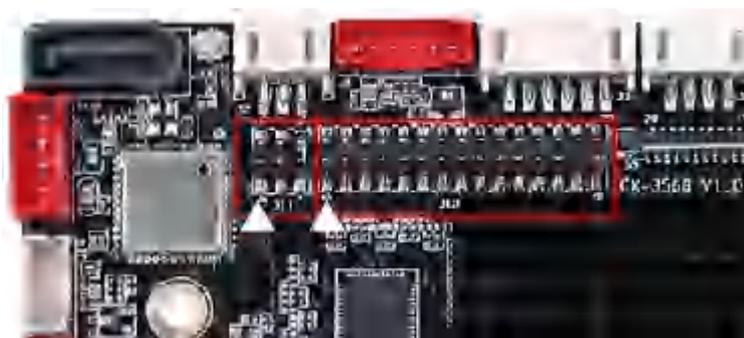
SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD power Output，+3.3V/+5V/+12V optional (red circle marked LVDS PIN1)
2			
3			
4	GND	GROUND	Ground
5			Ground
6	GND	GROUND	Ground
7	D0N	OUTPUT	Pixel0 Negative Data (Odd)
8	D0P	OUTPUT	Pixel0 Positive Data (Odd)
9	D1N	OUTPUT	Pixel1 Negative Data (Odd)
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	CLK0	OUTPUT	Negative Sampling Clock (Odd)
16	CLK0	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	CLK1	OUTPUT	Negative Sampling Clock (Even)
28	CLK1	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 less than 1.5A, when connect a 19inch or lager LCD panel, or if screen backlight power beyond 20W, 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.
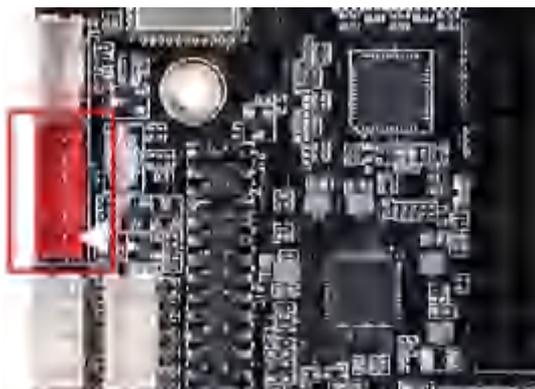
SN	Define	Property	Description
1	VCC	Power	12V Output
2	VCC	Power	12V Output
3	EN	OUTPUT	Backlight dis/enable control
4	PWM	OUTPUT	Backlight brightness control
5	GND	GROUND	Ground
6	GND	GROUND	Ground

◆ 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).
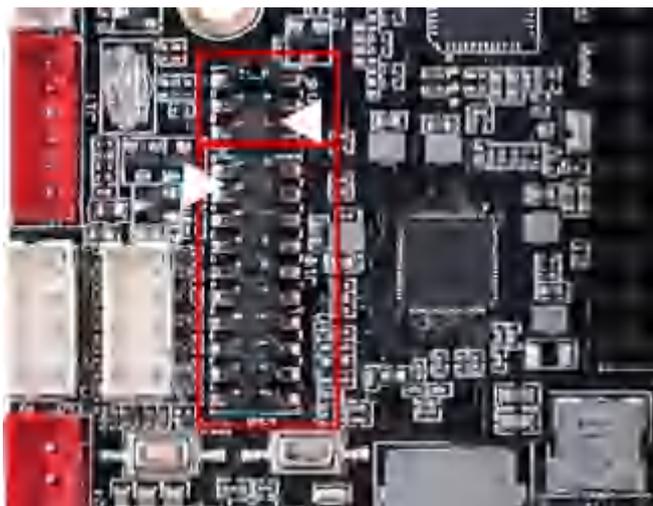
SN	Define	Property	Description
1	VCC	Power OUTPUT	LCD Power Output，+3.3V/+5V/+12V optional
2			
3	GND	GROUND	Ground
4			
5	TX0P	OUTPUT	EDP Pixel0 Positive Data (Odd)
6	TX0N	OUTPUT	EDP Pixel0 Negative Data (Odd)
7	TX1P	OUTPUT	EDP Pixel1 Positive Data (Odd)
8	TX1N	OUTPUT	EDP Pixel1 Negative Data (Odd)
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/four channel MIPI interface.
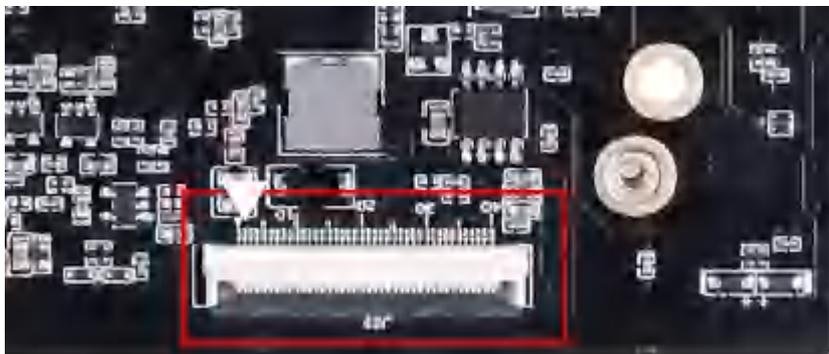
SN	Define	Property	Description
40	NC	-	Not connect
39	VDD	Power	Digital power
38	VDD	Power	Digital power
37	GND	GROUND	Ground
36	REST	OUTPUT	Global reset pin
35	NC	-	Not connect
34	GND	GROUND	Ground
33	D0N	OUTPUT	Negative MIPI differential data output
32	D0P	OUTPUT	Positive MIPI differential data output
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

◆ IO1

This port provides I/O control signal for peripheral devices, level is 3.3V. This port also added a power on/off switch pin.
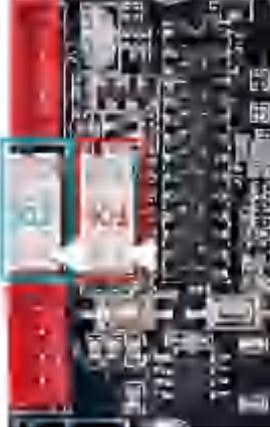
SN	Define	Property	Description
1	PWR	Power	OS turn on/off
2	RST	INPUT	Reset
3	I/O2	INPUT/OUTPUT	IO port
4	I/O 3	INPUT/OUTPUT	IO port
5	I/O 1	INPUT/OUTPUT	IO port
6	I/O 4	INPUT/OUTPUT	IO port
7	I/O 0	INPUT/OUTPUT	IO port
8	I/O 5	INPUT/OUTPUT	IO port
9	GND	GROUND	Ground
10	3V3	Power	VCC3V3 OUTPUT

◆ IO2

This port provides I/O control signal for peripheral devices, level is 3.

| SN	Define	Property	Description
1	I/O 11	INPUT/OUTPUT	IO port
2	I/O 9	INPUT/OUTPUT	IO port
3	I/O 10	INPUT/OUTPUT	IO port
4	I/O 8	INPUT/OUTPUT	IO port
5	NC	NC	NC
6	I/O 7	INPUT/OUTPUT	IO port
7	AD4	INPUT	Analog signal input pin/1.8V or less
8	I/O 6	INPUT/OUTPUT	IO port
9	GND	GROUND	Ground
10	3V3	Power	VCC3V3 OUTPUT

◆ **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 485 device direct connect.

2.TX/RX pin must connect to cable TX/RX pin correctly.
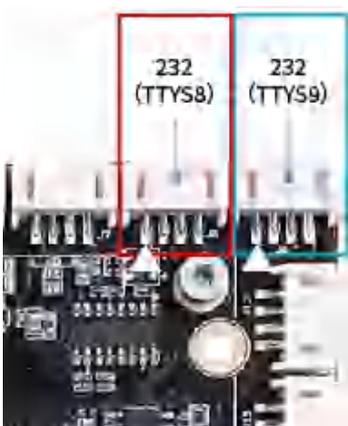
232 port 1 Serial port id:ttys8

SN	Define	Property	Description
1	GND	GROUND	Ground
2	PC-RX8	INPUT	232-RX
3	PC-TX8	OUTPUT	232-TX
4	VCC	Power	5V Output

232 port 2 Serial port id:ttys8

SN	Define	Property	Description
1	GND	GROUND	Ground
2	PC-RX9	INPUT	232-RX
3	PC-TX9	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）.
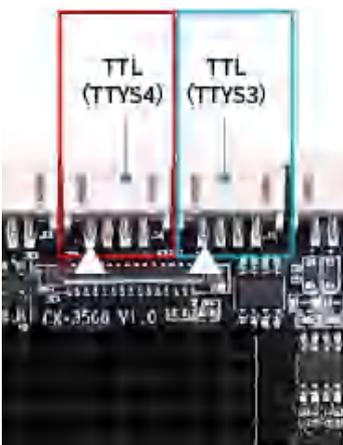
TTL port 1 Serial port id:ttys4

SN	Define	Property	Description
1	GND	GROUND	Ground
2	UART4-RX	INPUT	RX
3	UART4-TX	OUTPUT	TX
4	VCC	Power	3.3V Output

TTL port 2 Serial port id:ttys3

SN	Define	Property	Description
1	GND	GROUND	Ground
2	UART3-RX	INPUT	RX
3	UART3-TX	OUTPUT	TX
4	VCC	Power	3.3V Output

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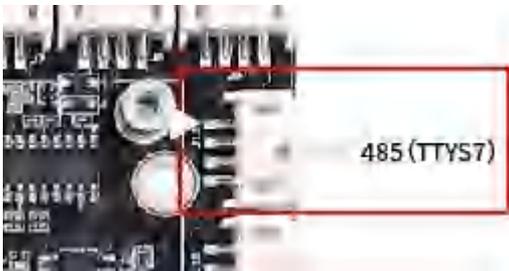
Motherboard provides a 485 serial port which can support mainstream serial ports devices. The voltage for 485 serial ports is 3.3V, if device connected request higher voltage, there must be an isolate circuit or level-shift circuit, otherwise motherboard and device might get burnout.

Note:

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

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

Serial port id: ttys7

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

◆ **CAN**

SN	Define	Property	Description
1	GND	GROUND	Ground
2	CANH2	INPUT	232-RX
3	CANL2	OUTPUT	232-TX
4	VCC	Power	5V Output

◆ **USB2.0*4**

Motherboard provides four internal USB ports for peripheral expansion, USB default mode is HOST, power current must less than 500mA. USB4 connected to CPU directly, rest USB port connected to USB HUB.
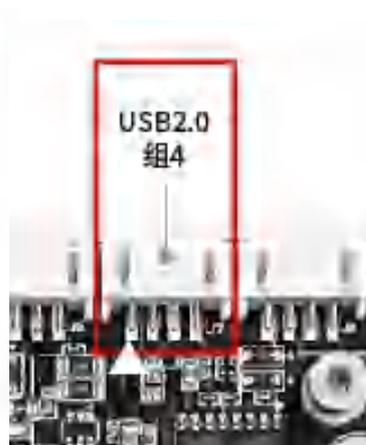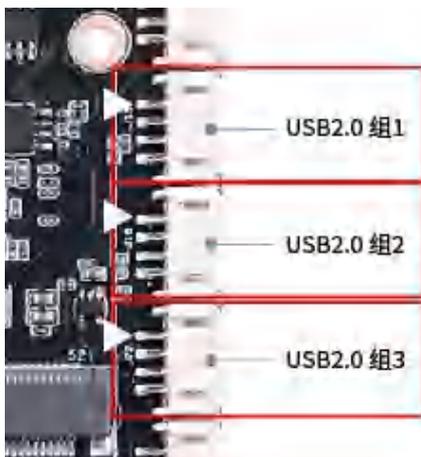
SN	Define	Property	Description
1	GND	GROUND	Ground
2	DP	INPUT/OUTPUT	DP
3	DM	INPUT/OUTPUT	DM
4	VCC	Power	5V Output

◆ **USB3.0**

Board provides two USB standard 3.0 interfaces for peripheral extension, a HOST port, power current must less than 2A; a OTG port, power current must less than 1 A.

USB 3.0 port is Compatible with USB2.0, support data storage, data input and USB mouse/keyboard, camera, touch screen connection.

◆ **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	Interrupt

◆ **Camera_IN**

This port supports MIPI cameras input 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/OUTPUT	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/OUTPUT	MIPI Data Channel 3 Positive
17	D3N	INPUT/OUTPUT	MIPI Data Channel 3 Negative
18	GND	GROUND	Ground
19	D2P	INPUT/OUTPUT	MIPI Data Channel 2 Positive
20	D2N	INPUT/OUTPUT	MIPI Data Channel 2 Negative
21	GND	GROUND	Ground
22	D1P	INPUT/OUTPUT	MIPI Data Channel 1 Positive
23	D1N	INPUT/OUTPUT	MIPI Data Channel 1 Negative
24	GND	GROUND	Ground
25	CLKP	INPUT/OUTPUT	MIPI Clock Channel Positive
26	CLKN	INPUT/OUTPUT	MIPI Clock Channel Negative

27	GND	GROUND	Ground
28	D0P	INPUT/OUTPUT	MIPI Data Channel 0 Positive
29	D0N	INPUT/OUTPUT	MIPI Data Channel 0 Negative
30	GND	GROUND	Ground

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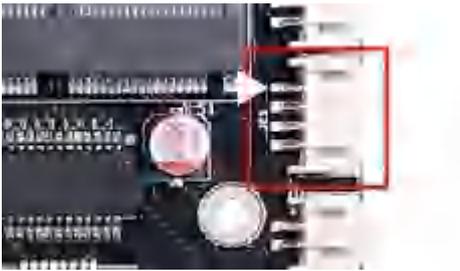
SN	Define	Property	Description
1	OUP-R	OUTPUT	Audio Output Right+
2	OUN-R	OUTPUT	Audio Output Right-
3	OUN-L	OUTPUT	Audio Output Left-
4	OUP-L	OUTPUT	Audio Output Left+

◆ **Ethernet**
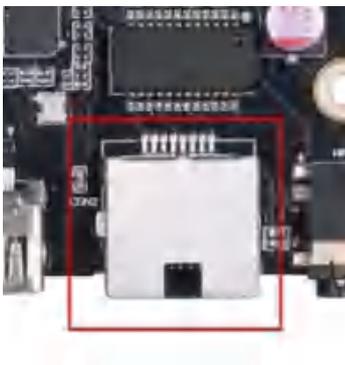
A Gigabit net port.

◆ **CAN**

SN	Define	Property	Description
1	GND	GROUND	Ground
2	CANH	High Signal	CAN High
3	CANL	Low Signal	CAN Low
4	VCC5V	Power	5V Power Output

◆ **Standard SATA**

◆ **SATA Power Input**

SN	Define	Property	Description
1	VCC-5V	Power Output	5V Power Output
2	GND	Digital GROUND	Ground
3	GND	Digital GROUND	Ground
4	VCC-12	Power Output	12V Power Output

◆ **Key Definition**

SW1: On-off button

SW2: Reset button

SW3: RECOVERY button

◆ Other Standard Interfaces And Functions

Storage	TF	Data storage, maximum 128G
	USB	USB3.0
HDMI	Standard	Support HDMI data output, maximum 4K/60HZ
Audio	Standard	3.5mm Standard Port
4G	PCI-E	Support HUAWEI,ZTE or other brand's mini PCI-E 4G module
SIM	Standard	Support all standard(depend on 4G module)

Chapter 4 Electrical Parameter

ITEM		MIN	NORMAL	MAX
Power	Voltage	--	12V	36V
	Ripple	--	--	100mV
	Current		4A	
Working current(connect to HDMI only)	Working	--	600mA	1500mA
	Standby	--	--	--
	USB Supply	--	--	500mA
Static	Contact discharge			4KV
	Air discharge			8KV
Environment	Relative humidity	--	--	80%
	Operating temperature	-20℃	--	60℃
	Storage temperature	-20℃		70℃

Remark 1:

Please chose the right backlight working voltage(3.3V,5V,12V) 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 board to EDP/LVDS screen, board′s working voltage and current is depend on EDP/LVDS screen, therefore we didn′t list those parameter in 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.