

OVIS MOTHERBOARD SERIES

OVMB-ARM-A64

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Chapter 1 Introduction

1.1 Applicability

- ◆ Advertising machine
- ◆ Digital signage
- ◆ Intelligent self-service terminal
- ◆ O2O smart equipment
- ◆ Intelligent vending machine
- ◆ Intelligent automation equipment

1.2 Functions

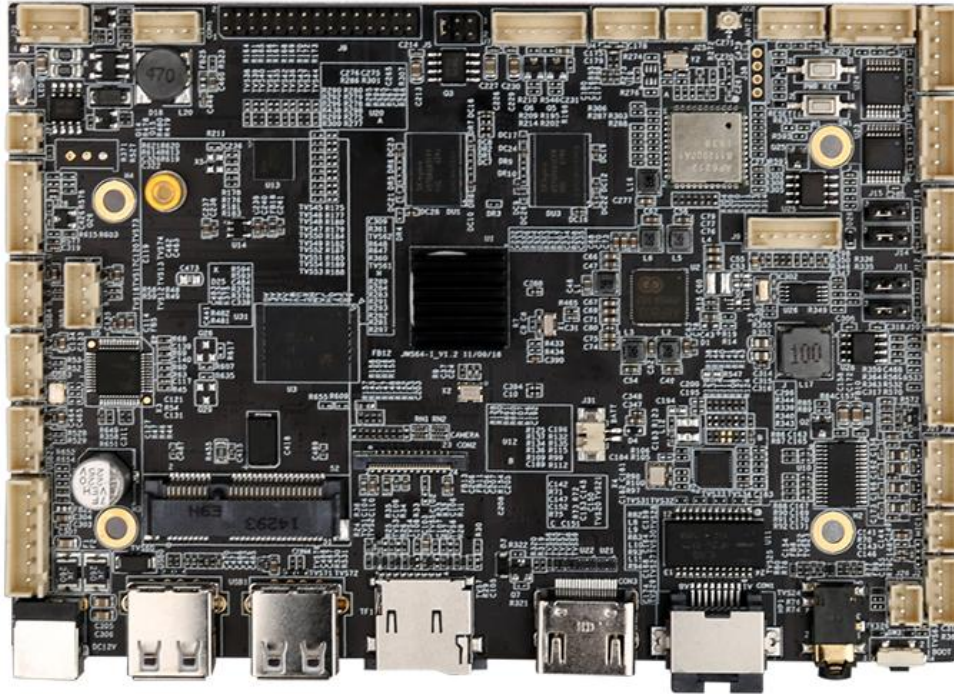
OVMB-ARM-A64 uses Allwinner R18 Cortex-A53 quad-core 64bit processor with Android 6.0 OS, its basic frequency is 1.2GHz, OVMB-ARM-A64 is best choice for high price performance quad-core terminal. Uses Mali400MP2 dual-core high performance GPU, it supports HDMI 4K output, whether it is Advertising, intelligent terminal or industrial control terminal, OVMB-ARM-A64 can satisfy customer request.(R18 and A64 is the same product with same soft/hardware, only different in name to identify different product line.)

1.3 Features

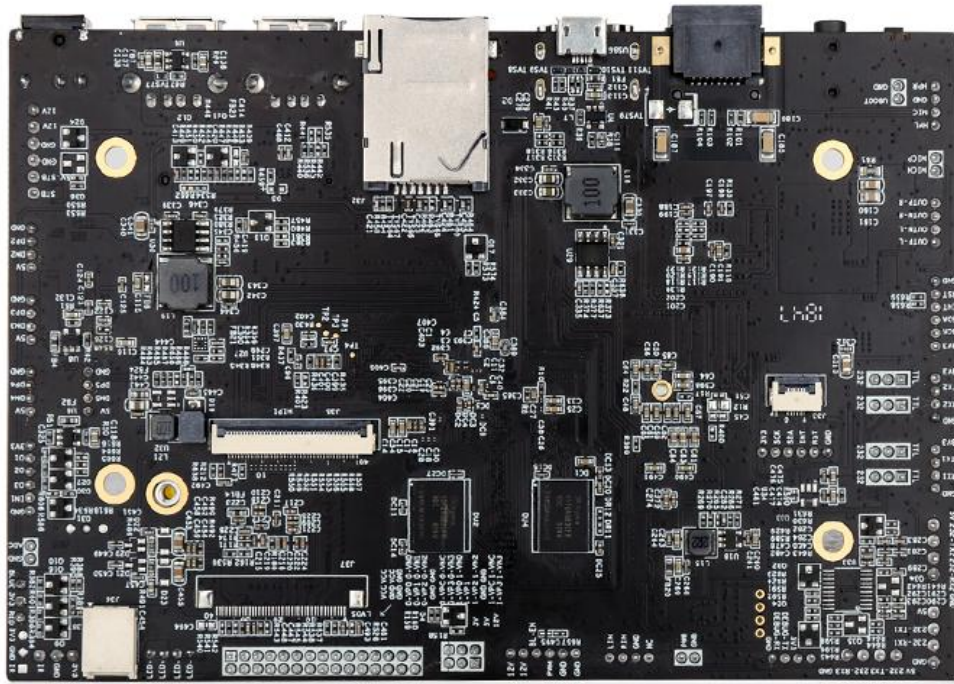
- Quad-core 64bit processor with Android 6.0 OS,OVMB-ARM-A64 is customer s most price-performance quad-core motherboard choice.
- 4K HDMI display and 4K video decoding. OVMB-ARM-A64 will give customer a truly high definition vision experience.
- EMMC5.1. High storage data transmission speed.
- Android system customization. OVMB-ARM-A64 provides system calling interface and API reference code, it supports upper-layer applications development perfectly.
- OVMB-ARM-A64 supports upgrade by remote/TF/computer etc, it also support configure display parameterby TF. OVMB-ARM-A64 also supports LVDS screen of various sizes and resolutions.
- Various expansion interfaces. has seven USB ports(four internal extension ports, two USB standard ports and a MICRO USB port.), a 232 port, two switchable TTL/232 ports, three GPIO output ports and a GPIO input port, a ADC port.it can satisfy your customization request for various devices.

1.4 Front/Back Side Picture

【Front】



【Back】

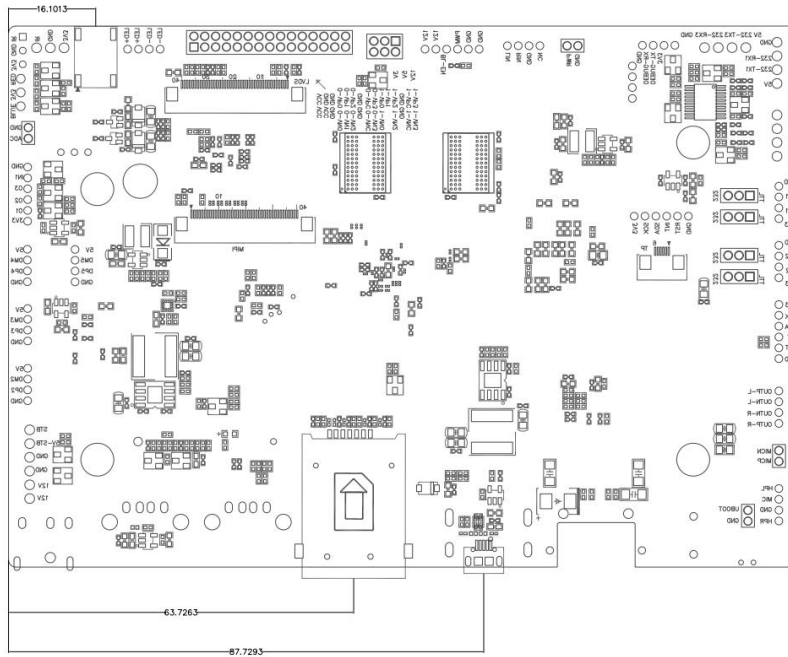
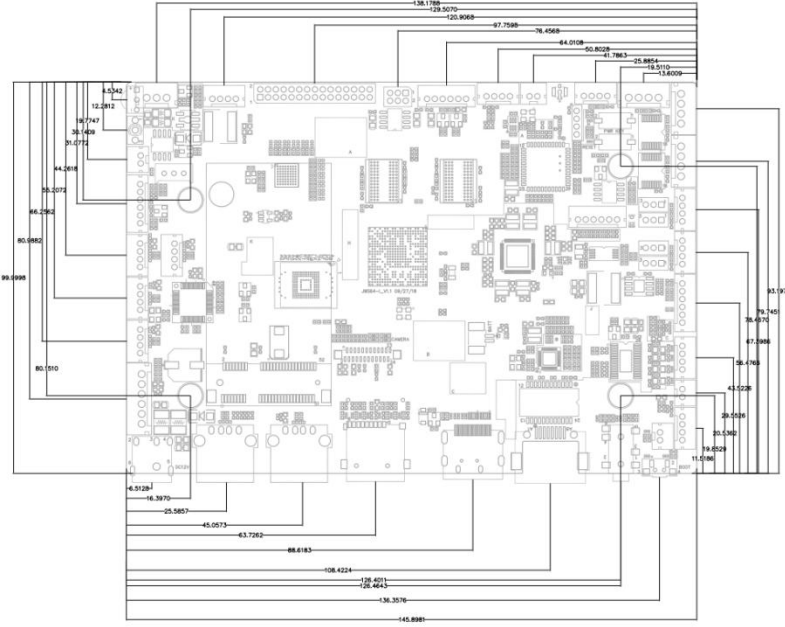


Chapter 2 Basic Informatio

Specifications	
CPU	A64、 Quad-core,1.2GHz
Memory	1G/2G(DDR3)
ROM	2KB EEPROM
Storage	EMMC 8G(16/32/64G optional)
Resolution	HDMI Maximum 4K 3840*2160
OS	Android 6.0
Play Mode	Supports multiple play modes such as loop,timing and interstitial.
Network	Ethernet,WIFI/BT 4.0,Wireless peripheral extension
Video Format	Support WMV,AVI,FLV,RM,RMVB,MPEG,TS,MP4 etc
Photograph	Support BMP,JPEG,PNG,GIF
USB 2.0	USB HOST*4,USB A*2,MICRO USB(OTG)*1
Serial port	232 port*1,TTL/232 switchable port*2
GPS	External GPS(Optional)
WIFI、 BT	Built-in dual frequency WIFI, BT4.0(Optional)
Ethernet	10M/100M/1000M adapt Ethernet
TF Card	Trans flash Card supported
LVDS	LVDS*1,supports single/dual channel 50/60Hz LCD panel
MIPI	MIPI*1, supports 50/60Hz LCD
AV Output	Support left and right channel output, built-in dual 4R/20W, 8R/10W amplifier
Real Time Clock	Supported
Timing Turn	Supported
OS Upgrade	Support upgrade through TF,USB

Chapter 3 PCB And Interface

3.1 PCB Drawing



PCB: 6 layers board

Size: 146*100mm, Thickness :1.6mm

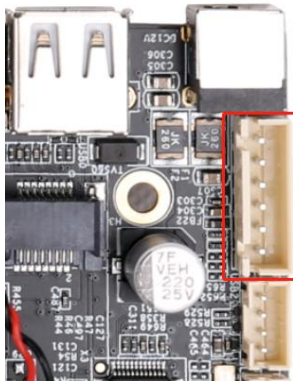
Screw hole size: $\phi 3.4\text{mm} * 4$

3.2 Interface Parameter Definition

◆ Power Input

Apply 12V DC power supply, motherboard can only uses power input from DC port or power input port, the adaptor DC input connector size 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 to input power supply, power input port have 6PIN and 2.54mm pin pitch.

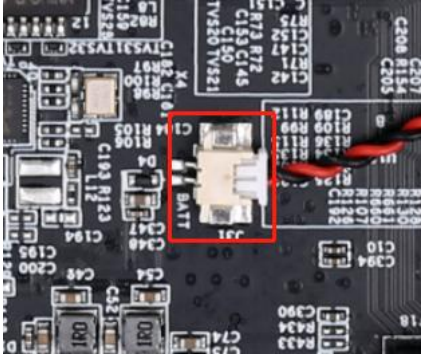
SN	DEFN	Property	Description
1	VCC	INPUT	12V Input
2	VCC	INPUT	12V Input
3	GND	GROUND	Ground
4	GND	GROUND	Ground
5	5V-STB	INPUT	STB 5V Input
6	STB	OUTPUT	STB signal Output

5V-STB and STB Output are designed for power board standby function, if customer need low-power consumption standby, connect 5V-STB 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 pins, 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).

◆ BAT RTC Battery

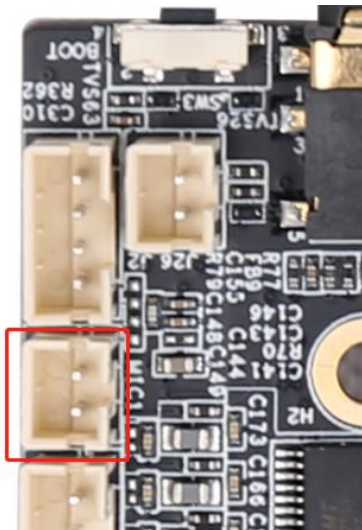
Supply power to OS clock when peripheral power disconnect.



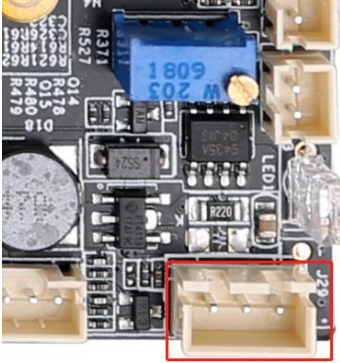
SN	Define	Property	Description
1	RTC	INPUT	3V Input
2	GND	GROUND	Ground

◆ MIC

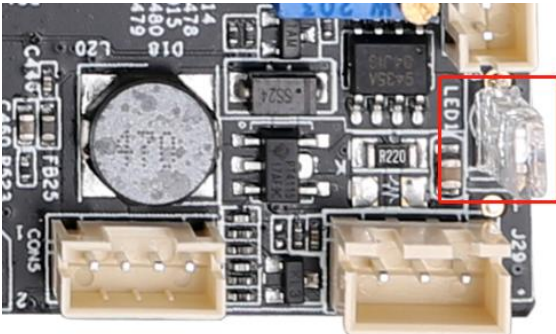
Please mind MIC P/N poles.



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

◆ Telecontrol


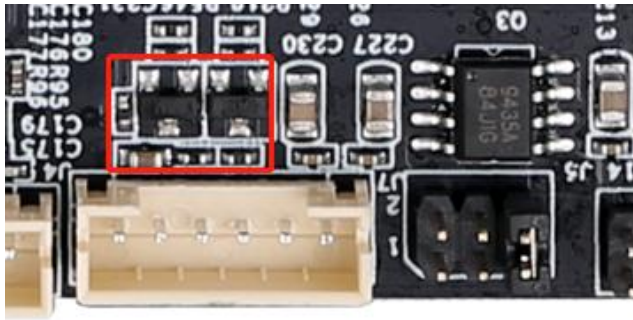
SN	Define	Property	Description
1	IR	INPUT	Telecontrol signal Input
2	GND	GROUND	Ground
3	3V3	Power	3.3V Output

◆ Indicator


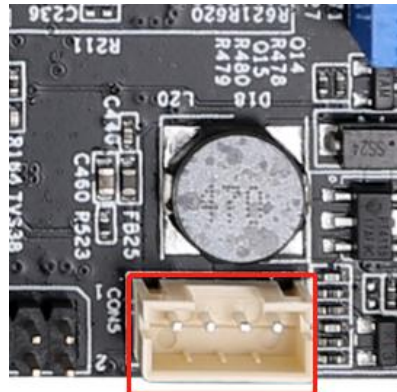
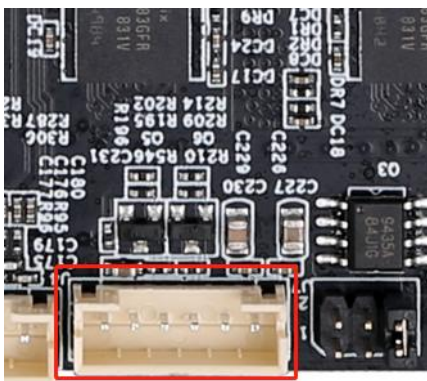
SN	Define	Property	Description
1	LED_B	Blue	Work state indicator
2	VCC	Power	3.3V Output
3	LED_R	Red	Standby state indicator

◆ Backlight Control

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 another power panel. This port can only be used to supply backlight power, never connect it to other device as power input. If user needs to adjust backlight by PWM, please see picture below and remove capacitance in red (N116HSE-EBC LCD for example).



SN	Define	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



◆ I/O Control

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



SN	Define	Property	Description
1	VCC	Power	3.3V Output
2	O1	OUTPUT	GPIO Output
3	O2	OUTPUT	GPIO Output
4	O3	OUTPUT	GPIO Output
5	IN1	INPUT	GPIO Input
6	GND	GROUND	Ground

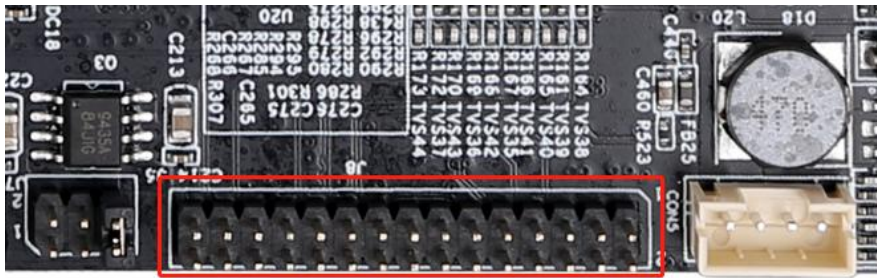
◆ Dual LVDS Channel Port

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 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.



Picture above shows jumper cap positions, from right to left is 3V/5V/12V.

SN	Define	Property	Description
1	VCC	Power	LCD power Output, +3.3v/+5V(Optional)
2			
3			
4	GND	GROUND	Ground
5			
6			
7	0-VN0	OUTPUT	Pixel0 Negative Data(Odd)
8	0-VN0	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	Ground
14	GND	GROUND	Ground

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	Ground
26	GND	GROUND	Ground
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)

24	NC	-	Not connect
25	GND	GROUND	Ground
26	NC	-	Not connect
27	NC	-	Not connect
28	SELB(3.3V)	OUTPUT	6bit/8bit mode select
29	AVDD	Power	Power for Analog Circuit
30	GND	GROUND	Ground
31	LED-	Power	LED Cathode
32	LED-	Power	LED Cathode
33	L/R(3.3V)	OUTPUT	Horizontal inversion
34	U/D(3.3V)	OUTPUT	Vertical inversion
35	VGL	Power	Negative power for TFT
36	NC	-	Not connect
37	NC	-	Not connect
38	VGH	Power	Positive power for TFT
39	LED+	Power	LED Anode
40	LED+	Power	LED Anode

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

◆ Camera

The maximum camera pixel motherboard can supported is 500W.



SN	Define	Property	Description
1	PWDN	OUTPUT	Power down
2	AGND	GROUND	Ground for analog circuit
3	SDA	INPUT/OUT	SCCB data
4	AVDD	Power	Power for analog circuit
5	SCL	OUTPUT	SCCB output clock
6	RESET	OUTPUT	Global reset pin
7	VSYNC	INPUT/OUT	DVP VSYNC output
8	NC	-	Not connect
9	HSYNC	INPUT/OUT	VP HSYNC output
10	DVDD	Power	Power for digital circuit
11	DOVDD	Power	Power for I/O circuit
12	DAT7	INPUT/OUT	DVP data output port 7
13	MCLK	OUTPUT	System output clock
14	DAT6	INPUT/OUT	DVP data output port 6
15	DGND	GROUND	Ground for digital circuit
16	DAT5	INPUT/OUT	DVP data output port 5
17	PCLK	INPUT/OUT	DVP PCLK output
18	DAT4	INPUT/OUT	DVP data output port 4
19	DAT0	INPUT/OUT	DVP data output port 0
20	DAT3	INPUT/OUT	DVP data output port 3
21	DAT1	INPUT/OUT	DVP data output port 1
22	DAT2	INPUT/OUT	DVP data output port 2
23	AFVDD	Power	Power for auto focus
24	AF_GND	GROUND	Ground for auto focus

◆ TTL *2

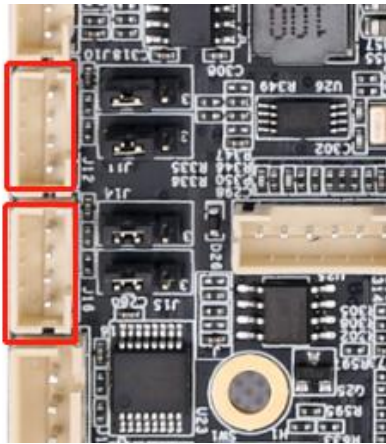
Motherboard provides two TTL serial ports which can support mainstream serial ports devices. The voltage for TTL serial ports is 0V~3.3V, if device connected request higher voltage, there must be an isolate circuit or level-shift circuit, otherwise motherboard and device might get burnout.

Note:

1. TTL serial port level must matched with device' s level, those ports can' t connect to MAX232/485 device directly.

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

Jumper cap can be mounted on different position to chose level for those port, relationship between cap and port is: cap J10 for TTL port J12;cap J11 for 232port J13;cap J14 for TTL port J16;cap J16 for 232 port J17.



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

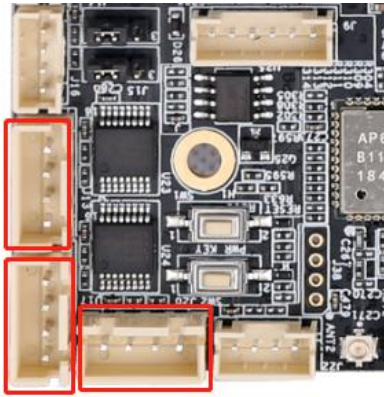
◆ **232 *3**

Note:

1.232 serial port level on board must matched with device' s level, those serial ports can' t connect to TTL/485 device directly.

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

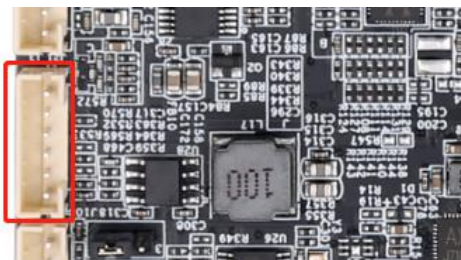
Jumper cap can be mounted on different position to chose level for those port, relationship between cap and port is: cap J10 for TTL port J12;cap J11 for 232port J13;cap J14 for TTL port J16;cap J16 for 232 port J17.



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

◆ **IIC Switch Port**

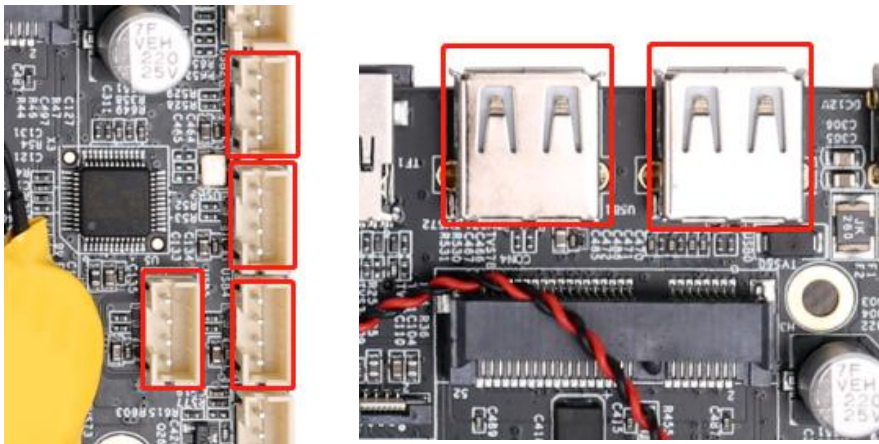
With a transform board from our company, I2C switch port can transform to TTL serial port or 8 channels GPIO port. This is designed for situations that lack of TTL/GPIO interface.



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

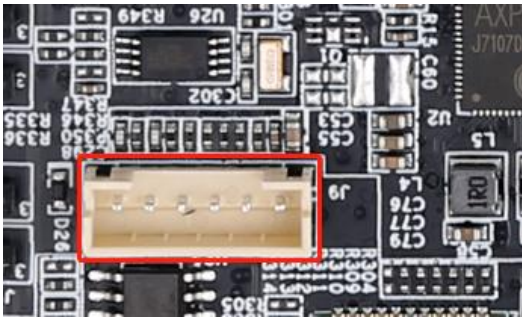
◆ USB

Motherboard provides two Host USB standard ports and 4 internal USB ports. The current for USB0/USB1,USB2/USB3,USB4/USB5 group is 1A. Motherboard also provides a MICRO USB port, current is 1A.



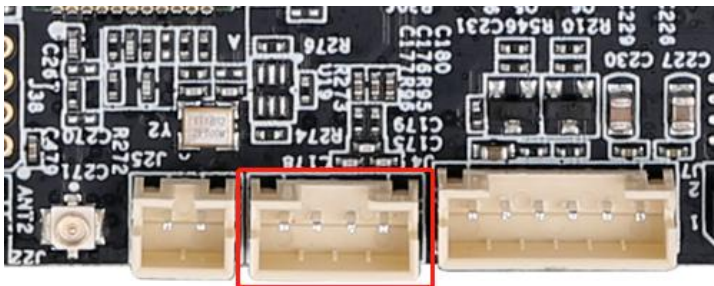
SN	Define	Property	Description
1	VCC	Power	5V Output
2	DM	INPUT/OUTPUT	DM
3	DP	INPUT/OUTPUT	DP
4	GND	GROUND	Ground

◆ Touch Screen(TP)



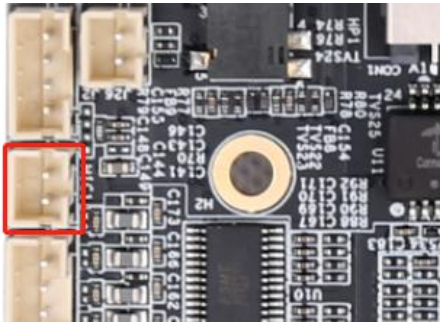
SN	Define	Property	Description
1	VCC	Power	3.3V Output
2	SCK	INPUT/OUTPUT	I2C Clock
3	SDA	INPUT/OUTPUT	I2C Data
4	INT	INPUT/OUTPUT	Interrupt
5	RST	INPUT/OUTPUT	Reset
6	GND	GROUND	Ground

◆ LINE_IN



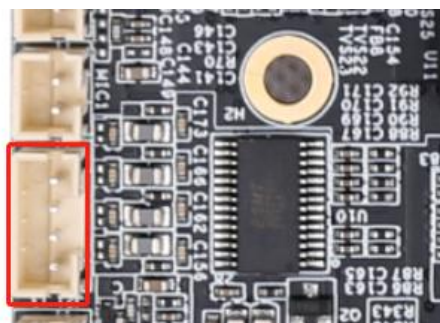
SN	Define	Property	Description
1	LIN	INPUT	Left audio input
2	RIN	INPUT	Right audio input
3	GND	GROUND	Ground
4	NC	DIS	Disabled

◆ Audio 1(Need Peripheral Amplifier)



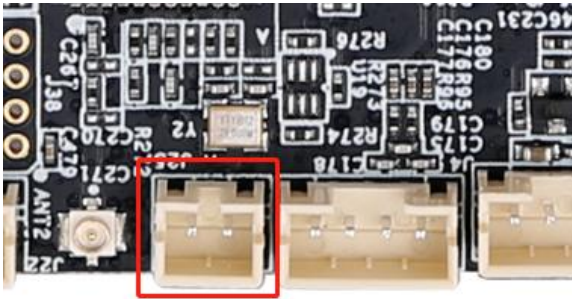
SN	Define	Property	Description
1	HPL	OUTPUT	Audio output left
2	MIC	INPUT	Headphone connection detect
3	GND	GROUND	Ground
4	HPR	OUTPUT	Audio output right

◆ Audio 2(Can Drive Speaker Directly)



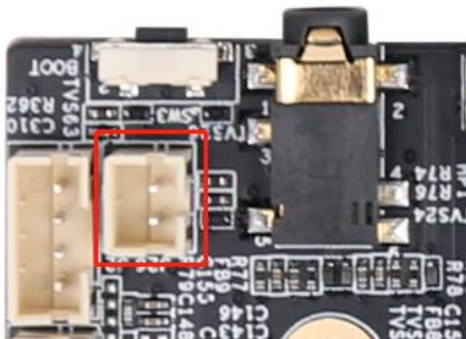
SN	Define	Property	Description
1	OUTP-R	OUTPUT	Audio output right positive
2	OUTN-R	OUTPUT	Audio output right negative
3	OUTN-L	OUTPUT	Audio output left negative
4	OUTP-L	OUTPUT	Audio output left positive

◆ Power On/Off Button



SN	Define	Property	Description
1	PWR	INPUT	Connect to power button left side
2	GND	GROUND	Connect to power button right side

◆ UBOOT



SN	Define	Property	Description
1	UBOOT	INPUT	Connect to UBOOT button left side
2	GND	GROUND	Connect to UBOOT button right side

◆ 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 1080P
Audio	Standard	3.55mm standard port
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	--	300mA	500mA
	Standby	--	17mA	20mA
	USB Supply	--	--	500mA
LVDS	3.3V	--	400 mA	500 mA
	5V	--	550 mA	1A
	12V	--	580 mA	1A
	USB Supply	--	--	500mA
Total output	Current	3.3V	--	800mA
Environment	Relative humidity	--	--	80%
	Operating temperature	-20°C	--	70°C

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.



MotherBoard Series

Embedded Android CPU

OVMB-ARM-A64