

UW-M358-V1.0 Android Smart Motherboard Technical Specification

Document modification history

	Remarks	Date
1	Creation	2021-3-15

1 Overview

The UW-M358 utilizes the Rockchip RK3568 (Cortex-A55x4) quad-core processor, runs the Android 11 operating system, and features a main frequency of up to 2.0 GHz, supporting 0.8TFLOPS of computing power. Its high performance and comprehensive interfaces make it a top-tier choice for benchmark testing and decoding, ideal for human-machine interaction and industrial control projects.

Key Features:

- Quad-core 64-bit Cortex-A55, up to 2.0 GHz
- Supports EDP/HDMI 2.0/MIPI/LVDS multi-display with differential display
- Comprehensive expansion interfaces: seven serial ports, nine USB ports, TF card slot, PCIE, SATA, and other expansion options.
- Six-layer gold-plated PCB, industrial-grade components selected for complex, harsh industrial control environments.

2 Specifications

Hardware Specifications:

CPU	Quad-core 64-bit Cortex-A55 processor with a clock speed up to 2.0GHz and supports 0.8TFLOPS of computing power.
GPU	ARM G52 2EE
Memory	LPDDR4 2GB/4GB/8GB/16GB (4GB as standard)
Built-in Storage	EMMC 8GB/16GB/32GB/64GB/128GB options (32GB as standard)
Display Interface	One LVDS interface (supports 6 or 8-bit single/dual channel LVDS) with a maximum resolution of 1920x1200. 1-channel EDP interface, supporting a maximum resolution of 2560x1600 1-channel MIPI interface, supporting a maximum resolution of 1920x1200 1-channel HDMI interface, supporting a maximum resolution of 4096x2160@60Hz
Onboard Backlight	Supports selectable 3.3V/5V/12V
Networking	RJ45 standard interface, 100Mbps Ethernet interface, supporting Ethernet.
	Supports 4G/5G PCIE interface module

	Integrated Bluetooth + Wi-Fi module, supporting Wi-Fi 802.11a/b/g/n protocols. Supports Bluetooth 4.2 protocol; Bluetooth 4.2 protocol support optional.
Image Rotation	Supports manual rotation of 0°, 90°, 180°, and 270°
Real-Time Clock	Integrated real-time clock with battery backup, supporting scheduled power on/off
Interface Devices	Supports USB camera
	9 USB HOST ports: two onboard, seven external
	5 TTL, 2 RS232, configurable as 7 TTL or 4 RS232 or 6 TTL&485 for expanding sensors or 1D code, QR code scanners, printers, card reader modules, etc.
	TF card expansion, supports up to 128GB
	Supports external power on/off button, reset button, or external button/light board, with multiple available interrupt IO ports
	Supports headphone output, built-in power amplifier, supports 2 channels of 8Ω 10W speakers
Audio Input	Supports MIC, one microphone interface, and headphone microphone
Touch Screen	Supports infrared, resistive, and capacitive touch screens

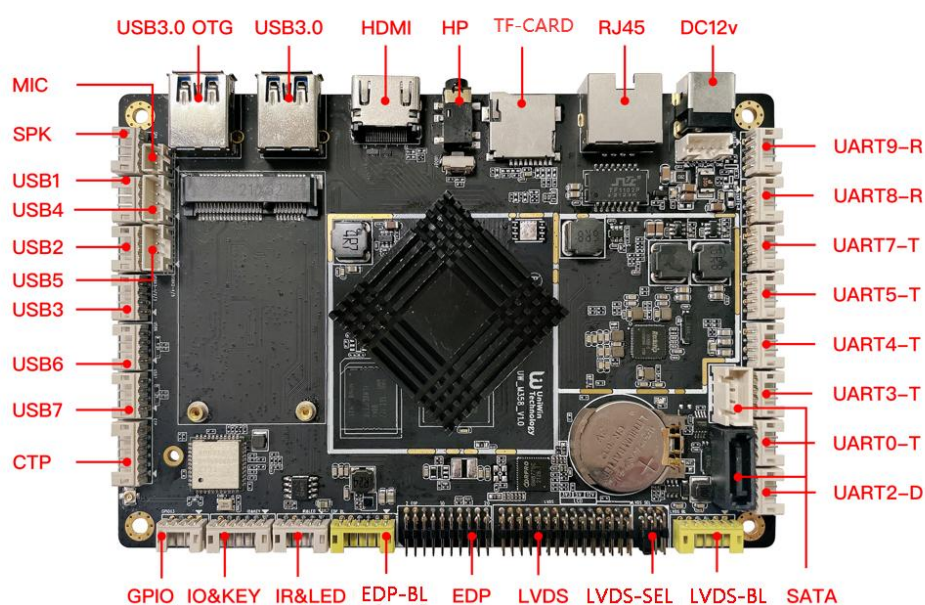
Software Specifications:

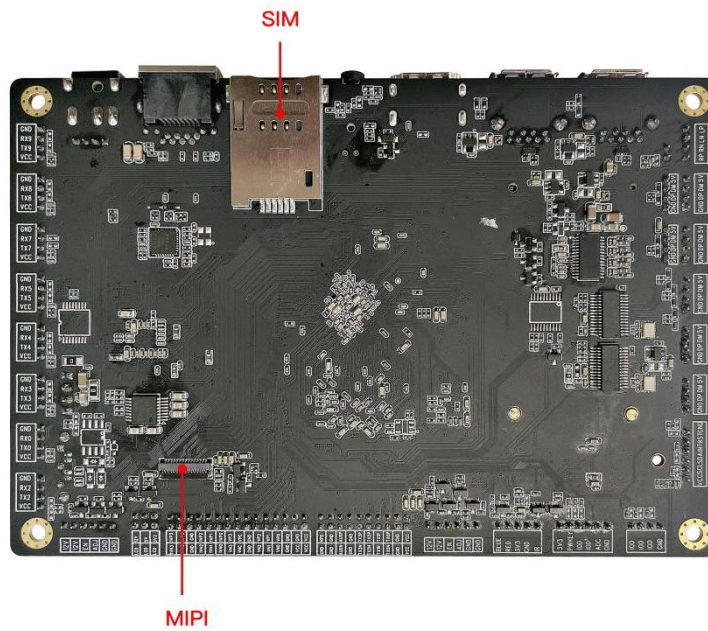
Operating System	Google Android 11 System (Android 12 System Optional)
Language	Multiple Languages
Video Format	● H.265 HEVC/MVC Main10 Profile yuv420@L5.1 up to 4096x2304@60fps ● H.264 AVC/MVC Main10 Profile yuv400/yuv420/yuv422/@L5.1 up to 4096x2304@60fps ● VP9 Profile0/2 yuv420@L5.1 up to 4096x2304@60fps ● VP8 version2, up to 1920x1088@60fps ● VC1 Simple Profile@low, medium, high levels, Main Profile@low, medium, high levels, Advanced Profile@level0~3, up to 1920x1088@60fps ● MPEG-4 Simple Profile@L0~6, Advanced Simple Profile@L0~5, up to 1920x1088@60fps ● MPEG-2 Main Profile, low, medium and high levels, up to 1920x1088@60fps ● MPEG-1 Main Profile, low, medium and high levels, up to 1920x1088@60fps ● H.263 Profile0, levels 10-70, up to 720x576@60fps
Audio Format	Supports MP3, WMA, MP2, OGG, AAC, M4A, MA4, FLAC, APE, 3GP, and WAV audio playback formats; supports playlist functionality
Image Browsing	Supports browsing of various image formats including JPG, BMP, PNG, and GIF, with rotation and slideshow playback. Maximum supported Resolution is 8176x8176.
Word Processing	EPUB, WORD, EXCEL, POWERPOINT, PDF, TXT
Input Method	Standard Android keyboard, with optional third-party input methods (Chinese, Korean, Japanese, etc.).

Basic Software	Camera, web browsing, online chat, email, e-books, file explorer.
System Management	File Manager
	Native Android system with open root permissions, enabling product customization and development.
	Timed Power On/Off
	Supports OTA remote upgrades.

3 Main Interfaces

3.1 Interface PIN Distribution Diagram

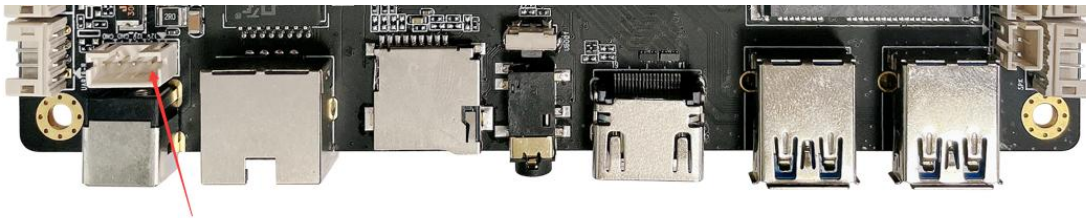




3.2 Introduction to Main Interfaces

- ◆ DC12V Power Socket (triangle direction indicates Pin 1, 4PIN/2.0).

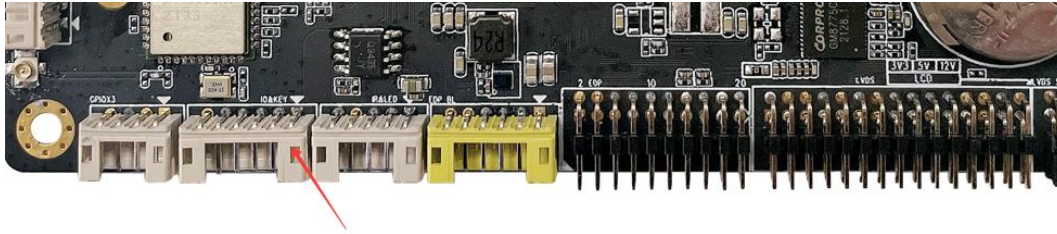
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No.	Definition	Attribute	Description
1	12V	Power Input	+12V Power Input
2	12V	Power Input	+12V Power Input
3	GND	Ground	Ground
4	GND	Ground	Ground

- ◆ POWER/IO/ADCKEY (Triangle indicates Pin 1, 6PIN/2.0)

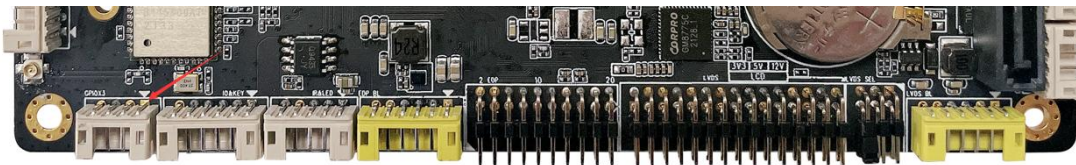
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No.	Definition	Attribute	Description
1	3.3V	Power Output	3.3V
2	PWR	Output	Power On/Off Button
3	IO	Input/Output	GPIO0_B0_U
4	IO	Input/Output	GPIO2_D3_D
5	ADC	Input	Requires key value matching
6	GND	Ground	Ground

◆ GPIOx3 (Triangle indicates Pin 1, 4PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	IO	Input/Output	GPIO2_D4_D
2	IO	Input/Output	GPIO2_D5_D
3	IO	Input/Output	GPIO2_D6_D
4	GND	Ground	GND

◆ UART2 Debug Port System Print Information (Triangle indicates Pin 1, 4PIN/2.0)

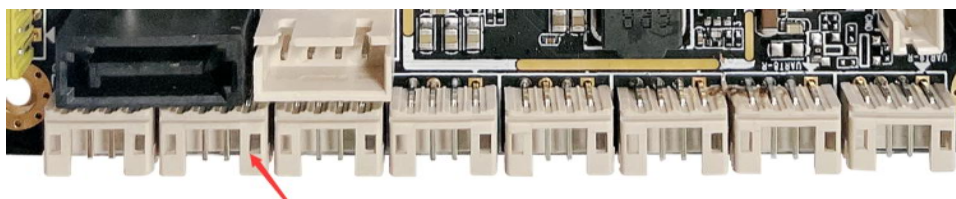
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No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX2	Input	UART Data Input
3	TX2	Output	UART Data Output
4	VCC	3.3V Power Output	3.3V Power Output

- ◆ UART0 Serial Port TTL (Pin 1 indicated by triangle, 4PIN/2.0);
RS485 optional

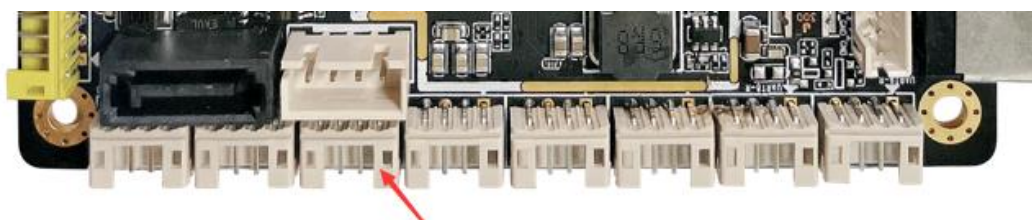
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No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX0/B	Input	UART Data Input
3	TX0/A	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

- ◆ UART3 Serial Port TTL (Pin 1 indicated by triangle, 4PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX3	Input	UART Data Input
3	TX3	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

◆ UART4 Serial Port TTL (Pin 1 indicated by triangle, 4PIN/2.0)

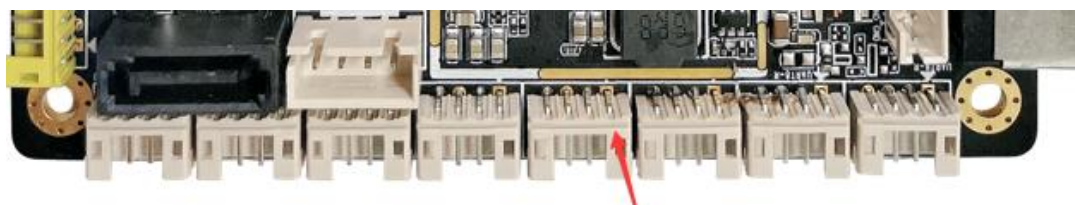
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No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX4	Input	UART Data Input
3	TX4	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

◆ UART5 Serial Port TTL (Pin 1 indicated by triangle, 4PIN/2.0);
RS232 optional

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX5	Input	UART Data Input

3	TX5	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

- ◆ UART7 Serial Port TTL (Pin 1 indicated by triangle, 4PIN/2.0);
RS232 optional

As indicated by the arrow in the figure below

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX7	Input	UART Data Input
3	TX7	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)



- ◆ UART8 Serial Port RS232 (Pin 1 indicated by triangle, 4PIN/2.0);
TTL optional

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX8	Input	UART Data Input
3	TX8	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

- ◆ UART9 Serial Port RS232(Triangle indicates Pin 1, 4PIN/2.0) TTL optional

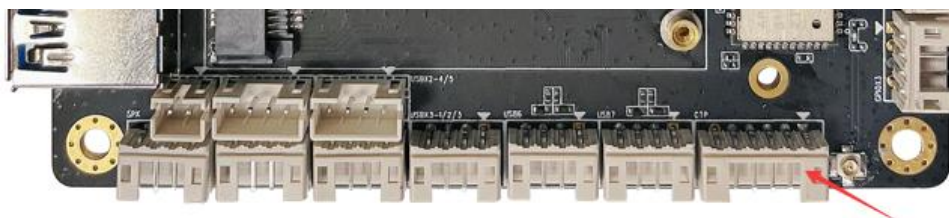
As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX9	Input	UART Data Input
3	TX9	Output	UART Data Output
4	3.3V	3.3V Power Output	3.3V Power Output (5V optional)

- ◆ CTP Touch Screen Interface (Triangle indicates Pin 1, 6PIN/2.0)

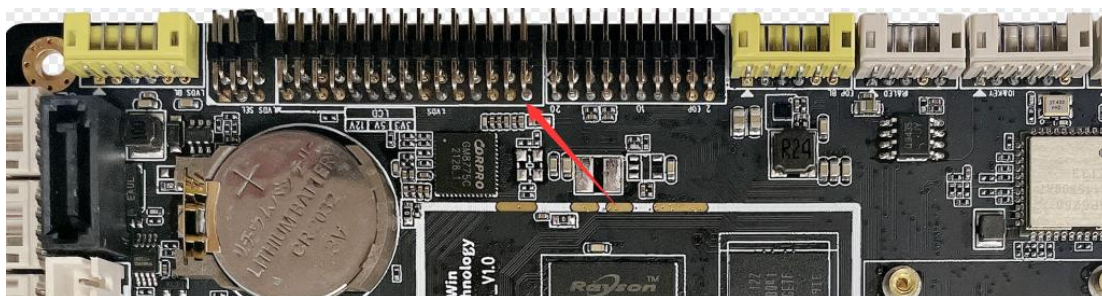
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No.	Definition	Attribute	Description
1	3.3V	Output	3.3V Output
2	SCL	Output	Clock Signal
3	SDA	Input/Output	I2C Data
4	INT	Input	Interrupt
5	REST	Output	Reset
6	GND	Ground	Ground

- ◆ LVDS LCD Interface (Triangle indicates Pin 1, 30PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	VCC_Panel	Power Output	LCD power output, selectable 3.3V/5V/12V depending on the LCD panel (selected via JP6 jumper cap)
2			
3			
4	GND	Ground	Power Ground
5			
6			
7	RX00-	Output	Pixel0 Negative Data (Odd)
8	RX00+	Output	Pixel0 Positive Data (Odd)
9	RX01-	Output	Pixel1 Negative Data (Odd)
10	RX01+	Output	Pixel1 Positive Data (Odd)
11	RX02-	Output	Pixel2 Negative Data (Odd)
12	RX02+	Output	Pixel2 Positive Data (Odd)
13	GND	Ground	Power Ground
14			
15	RXOC-	Output	Negative Sampling Clock (Odd)
16	RXOC+	Output	Positive Sampling Clock (Odd)
17	RX03-	Output	Pixel3 Negative Data (Odd)
18	RX03+	Output	Pixel3 Positive Data (Odd)
19	RXE0-	Output	Pixel0 Negative Data (Even)
20	RXE0+	Output	Pixel0 Positive Data (Even)
21	RXE1-	Output	Pixel1 Negative Data (Even)
21	RXE1+	Output	Pixel1 Positive Data (Even)
23	RXE2-	Output	Pixel2 Negative Data (Even)
24	RXE2+	Output	Pixel2 Positive Data(Even)
25	GND	Ground	Power Ground
26			
27	RXEC-	Output	Negative Sampling Clock (Even)

28	RXEC+	Output	Positive Sampling Clock (Even)
29	RXE3-	Output	Pixel3 Negative Data (Even)
30	RXE3+	Output	Pixel3 Positive Data (Even)

◆ LVDS LCD Panel Voltage Selection Interface (Triangle indicates Pin 1, 2X3PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	LCD12V	Power Output	Power Output, +12V
3	LCD5V	Power Output	Power Output, +5V
5	LCD3.3V	Power Output	Power Output, +3.3V
2	LCD-POWER	Power Input	Select LVDS display voltage based on 1, 3, 5
4			
6			

◆ LVDS Backlight Power Control (Triangle indicates Pin 1, 6PIN/2.0/yellow)

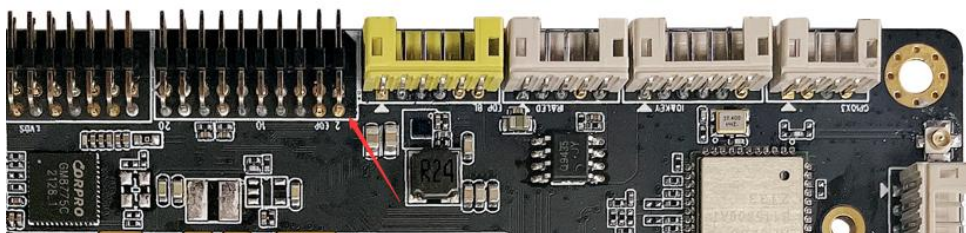
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No.	Definition	Attribute	Description
1	12V	Power Output	Backlight Power Output
2			
3	BL_EN0	Output	Backlight Board Switch Control Pin
4	BL_PWM	Output	Backlight Board Brightness Control Pin
5	GND	Ground	Ground
6			

◆ EDP Display Interface (Triangle indicates Pin 1)

As indicated by the arrow in the figure below

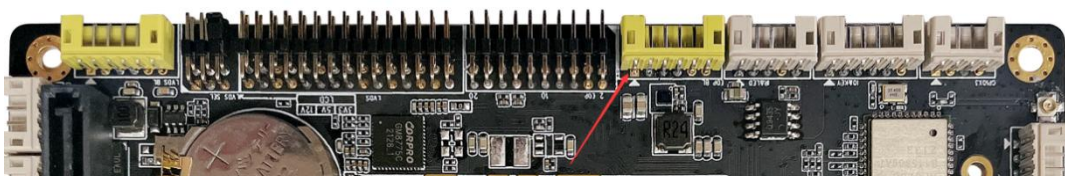


1	Output	12V Output (maximum current 1500mA)
2	Output	12V Output (maximum current 1500mA)
3	Ground	Ground
4	Ground	Ground
5	Output	EDP 0 Negative Data
6	Output	EDP 0 Positive Data
7	Output	EDP 1 Negative Data
8	Output	EDP 1 Positive Data
9	Output	EDP 2 Negative Data
10	Output	EDP 2 Positive Data
11	Output	EDP 3 Negative Data

12	Output	EDP 3 Positive Data
13	Ground	Ground
14	Ground	Ground
15	Output	Negative Sampling Clock
16	Output	Positive Sampling Clock
17	Ground	Ground
18	Ground	Ground
19	Ground	Ground
20	NC	NC

- ◆ EDP Backlight Power Control (Triangle indicates Pin 1, 6PIN/2.0/yellow)

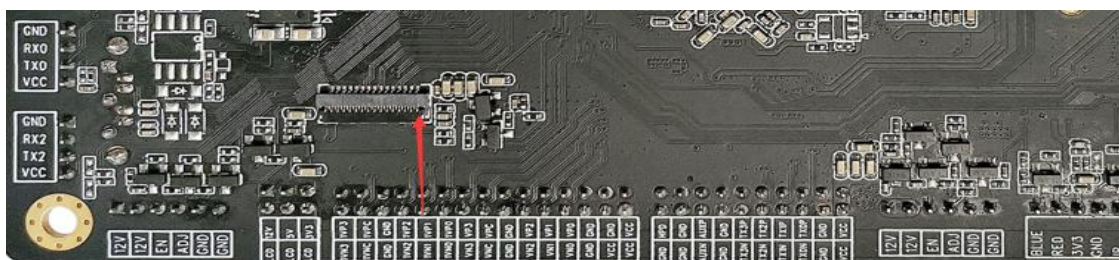
As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	12V	Power Output	Backlight Power Output
2			
3	BL_EN0	Output	Backlight Board Switch Control Pin
4	BL_PWM	Output	Backlight Board Brightness Control Pin
5	GND	Ground	Ground
6			

- ◆ MIPI DSI (Triangle direction indicates Pin 1, 31PIN/0.3mm)

As indicated by the arrow in the figure below

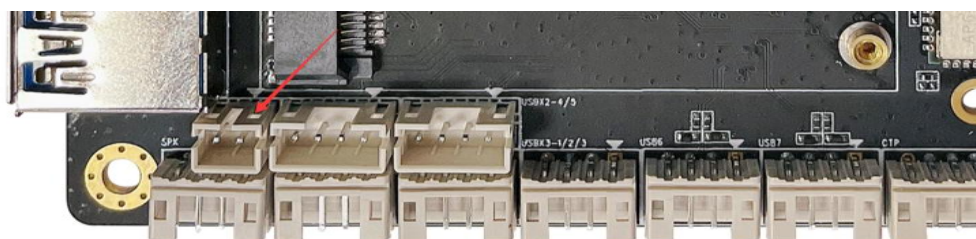


No.	Definition	Attribute	Description
1	3.3V	Power Supply	LCD_VCC
2	3.3V	Power Supply	LCD_VCC
3	1.8V	Power Supply	LCD_VDD
4	GND	Ground	Ground
5	RESET	Reset	Display Reset
6	1.8V	Power Supply	LCD_VDD
7	GND	Ground	Ground
8	D3N	Signal Input	MIPI DATA
9	D3P	Signal Input	MIPI DATA
10	GND	Ground	Ground
11	D0N	Signal Input	MIPI DATA
12	D0P	Signal Input	MIPI DATA
13	GND	Ground	Ground
14	CLKN	Signal Input	MIPI DATA
15	CLKP	Signal Input	MIPI DATA
16	GND	Ground	Ground
17	D1N	Signal Input	MIPI DATA
18	D1P	Signal Input	MIPI DATA
19	GND	Ground	Ground
20	D2N	Signal Input	MIPI DATA
21	D2P	Signal Input	MIPI DATA
22	GND	Ground	Ground
23	GND	Ground	Ground
24	LED-	Power Supply	Backlight Power Negative
25	LED-	Power	Backlight Power Negative

		Supply	
26	LED-	Power Supply	Backlight Power Negative
27	LED-	Power Supply	Backlight Power Negative
28	NC	NC	NC
29	LED+	Power Supply	Backlight Power Positive
30	LED+	Power Supply	Backlight Power Positive
31	LED+	Power Supply	Backlight Power Positive

- ◆ MIC Microphone Interface (Triangle direction indicates Pin 1, 2PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	MIC-	Audio Input	Audio Input-
2	MIC+	Audio Input	Audio Input+

- ◆ **Speaker Output** (Triangle direction indicates Pin 1, 4PIN/2.0)

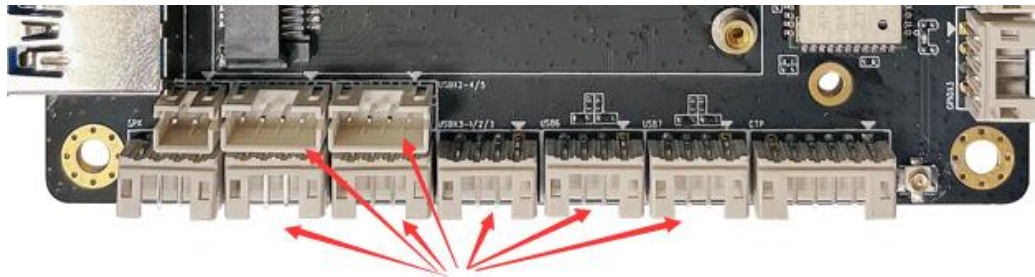
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No.	Definition	Attribute	Description
1	OUTP-L+	Output	Left Channel Audio + Signal (Connect to Speaker+)
2	OUTN-L-	Output	Left Channel Audio - Signal (Connect to Speaker-)
3	OUTN-R-	Output	Right Channel Audio - Signal (Connect to Speaker-)
4	OUTP-R+	Output	Right Channel Audio + Signal (Connect to Speaker+)

◆ USB External Interface*7 (Triangle direction indicates Pin 1, 4PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	DP	Input\Output	D+ Signal Line
3	DM	Input\Output	D- Signal Line
4	5V Power	Power Output	Power Output +5V

◆ Remote Control Receiver, Operation Indicator Light (Triangular mark indicates Pin 1, 4PIN/2.0)

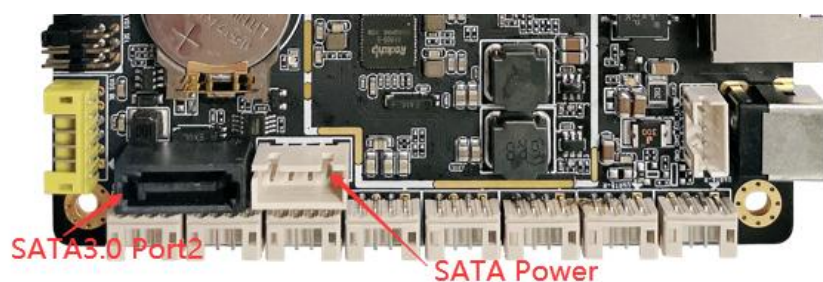
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No.	Definition	Attribute	Description
1	LED_B	Blue Light	Operation Status Indicator
2	LED_R	Red Light	Standby Status Indicator
3	VCC_MCU	MCU Power	MCU Power
4	GND	Ground	Ground
6	IR	Input	Remote Control Receiver Signal Input

◆ SATA (Triangular mark indicates Pin 1, 4PIN/2.0)

As indicated by the arrow in the figure below



No.	Definition	Attribute	Description
1	5V	Power Output	Power Output +5V
2	GND2	Ground	Ground
3	GND1	Ground	Ground
4	12V	Power Output	Power Output +12V

4 Dimensions

4.1 Board Dimensions

PCB Length: 148mm; PCB Width: 102mm; Overall board height approximately 11mm. For more details structural diagrams Please consult our sales representatives.

