UW-M359-V-V1.1 Android AI Smart Access/Gate Control Motherboard Technical Specification

Document modification history

	Remarks	Date
1	Creation	2023-4-15

1 Overview

The UW-M359-V utilizes the Rockchip RK3568 (Cortex-A55x4) quad-core processor and runs the Android 11/12 OS (Debian/Ubuntu and other Linux systems are optional). With a main frequency of up to 2.0GHz and support for 0.8T computing power, this high-performance, feature-rich, slim, and ultra-thin motherboard excels in both benchmarking and decoding. It is ideally suited for applications such as gate machines, access control systems, attendance machines, intelligent self-service terminals, industrial control hosts, and robotic devices.

Key Features:

- Quad-core 64-bit Cortex-A55 with a main frequency up to 2.0GHz
- Supports EDP/HDMI2.0/ MIPI DSIx2 multi-display with independent output, HDMI resolution up to 4K
- Supports Ethernet (with PoE power supply), WIFI, BT, 4G (4G module can be directly mounted on the motherboard)
- Supports MIPI dual-lens (Infrared + Visible) / USB dual-lens (Infrared + Visible) camera configurations for more accurate facial recognition
- Rich extension interfaces: TTL x5, RS232 x2, RS485 x1, USB x6, Relay, Wiegand input, Wiegand output, LED indicator, GPIO, and other expansion interfaces

- Supports Android/LINUX system customization (Linux supports Debian11, Ubuntu18.04, or Buildroot QT), providing system call API reference code for seamless customer upper-layer application development.
- 6-layer immersion gold PCB, industrial-grade components selected to meet the requirements of complex, harsh industrial control environments

2 Specifications

Hardware Specifications:

CPU	Quad-core 64-bit Cortex-A55, up to 2.0GHz, supports 0.8TOPS computing power
GPU	ARM G52 2EE
Memory	LPDDR4 2GB/4GB/8GB (default 2GB)
Built-in Storage	EMMC 8GB/16GB/32GB/64GB/128GB options (default 8GB)
Display Interface	2-channel MIPI interface, supports maximum resolution of 1920x1200 @60Hz 1-channel EDP interface, supporting a maximum resolution of 2560x1600@60Hz 1-channel HDMI interface, supporting a maximum resolution of 4096x2160@60Hz
Camera Interface	Supports MIPI binocular (Infrared + Visible) / USB binocular (Infrared + Visible) camera
Network	100Mbps Ethernet interface with PoE power supply support
	Supports onboard 4G, ESIM, SIM card holder, or external card holder
	Supports Wi-Fi and Bluetooth module, compliant with Wi-Fi 802.11b/g/n protocols (compatible with WiFi 6 or 5G WiFi) Supports Bluetooth 4.2 protocol (compatible with Bluetooth 5.0 protocol)

Image rotation	Supports manual rotation of 0 degrees, 90 degrees, 180 degrees, and 270 degrees
Real-time clock	Built-in real-time clock
Interface devices	6 USB HOST ports, 4 on-board, 2 on the tail cable
	5 serial ports, configurable as TTL, RS232, or RS485 (default: TTL), for expanding temperature measurement, ID card, barcode scanning, and card reader modules, etc.
	Supports 1-channel relay interface.
	Supports 1-channel Wiegand input and 1-channel Wiegand output interface, compatible with Wiegand 26/34 protocol.
	Supports multiple GPIOs for expanding functionalities such as door release buttons, door magnetic sensors, and alarm outputs.
	Supports independent control of red, green, and white fill lights, as well as infrared fill lights.
	Supports external power on/off buttons.
	Integrated power amplifier, compatible with 4Ω3W speakers.
	Supports headphone output interface, allowing for expansion to external power amplifier output.
Audio Input	Supports MIC, with one microphone interface.
Touch Screen	Supports infrared, resistive, and capacitive touch screens.

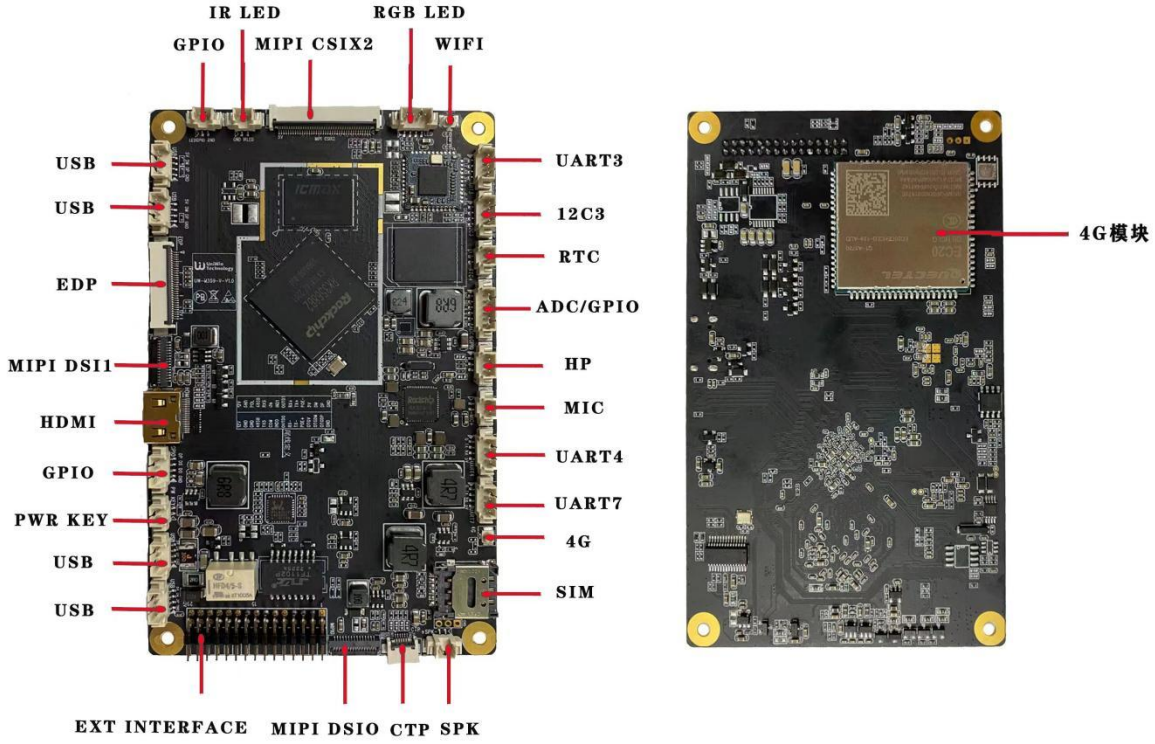
Basic Software Specifications:

Operating System	Google Android 11 System (Android 12 System optional)
Language	Multi-language
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 verision2,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 audio playback in MP3, WMA, MP2, OGG, AAC, M4A, MA4, FLAC, APE, 3GP, WAV formats, including song list functionality.
Image Browsing	Supports browsing of JPG, BMP, PNG, GIF, and other image formats, with rotation and slideshow playback capabilities. Resolutions up to 8176x8176 are supported.
Document 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-book, File Manager
System Management	File Manager
	Native Android system with open root permissions, enabling product customization and development.
	Supports OTA remote upgrades.

3 Main Interfaces

3.1 Interface Distribution Diagram



3.2 Introduction Main Interfaces

◆ PWR KEY **(Pin 1 indicated by triangle,** 2PIN/1.25 **)**

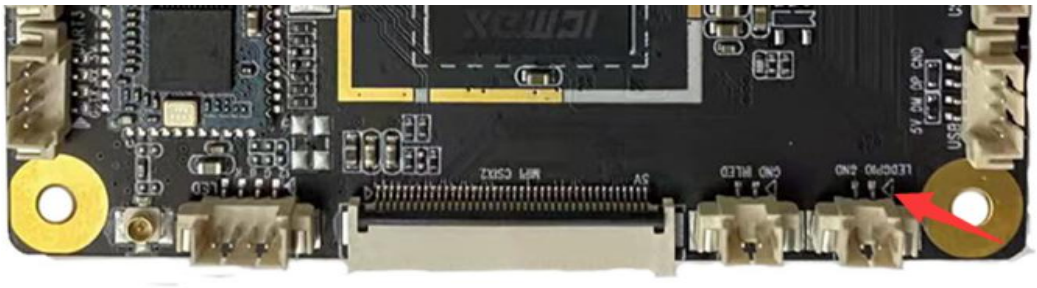
As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	PWR	Output	Power On/Off Button

◆ GPIOx3 **(Pin 1 indicated by triangle,** 4PIN/1.25 **) As indicated by the arrow in the figure below.**

No.	Definition	Attribute	Description
1	GND	Ground	GND
2	GPIO2_D2	Output	Connects to doorbell output; disconnected by default.
3	GPIO2_D1	Input	Door magnet detection, default high level
4	GPIO2_D0	Input	Door release button, default high level

◆ GPIO **(Triangle indicates Pin 1,** 2PIN/1.25 **) as shown by the arrow in the figure below**

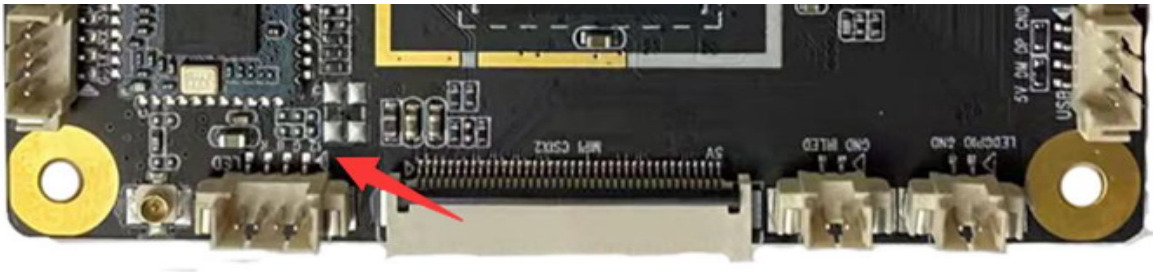


No.	Definition	Attribute	Description
1	GPIO4_A1	Input/Output	Compatible with our white light board, white light control IO, default low
2	GND	Ground	GND

- IR LED (Triangle indicates Pin 1, 2PIN/1.25 **) as shown by the arrow in the figure below**

No.	Definition	Attribute	Description
1	GND	Ground	GND
2	LED_5V	Power Supply	Infrared LED power supply, controllable

- RGB LED (Triangle indicates Pin 1, 4PIN/1.25 **) as shown by the arrow in the figure**



No.	Definition	Attribute	Description

1	VCC	Power Supply	12V
2	POWER_LED_G	Power Supply	Green LED negative terminal
3	POWER_LED_B	Power Supply	Blue LED negative terminal
4	POWER_LED_R	Power Supply	Red LED negative terminal

◆ USB interface*4 (Triangular orientation indicates Pin 1, 4PIN/1.25)

The four USB ports are indicated by the arrow direction 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	Output	Power Output

◆ UART3 TTL serial port **(Triangular orientation indicates Pin 1 , 4PIN/1.25)**

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX3	Output	UART Data Output
3	RX3	Input	UART Data Input

4	VCC	Power Supply	5V

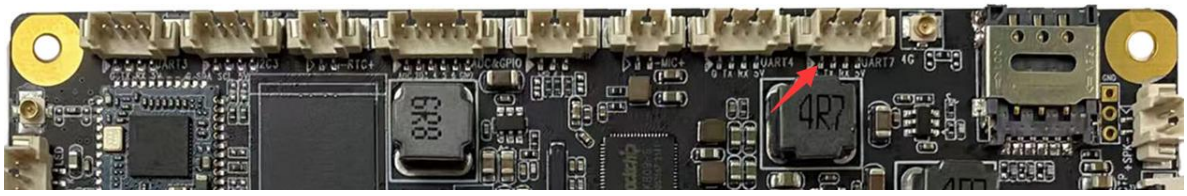
◆ UART4 TTL serial port **(Triangular orientation indicates Pin 1 ,** 4PIN/1.25 **)**

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX4	Output	UART Data Output
3	RX4	Input	UART Data Input
4	VCC	Power Supply	5V

◆ UART7 TTL/RS232 serial port **(Triangular orientation indicates Pin 1 ,** 4PIN/1.25 **)**

As indicated by the arrow in the figure below.



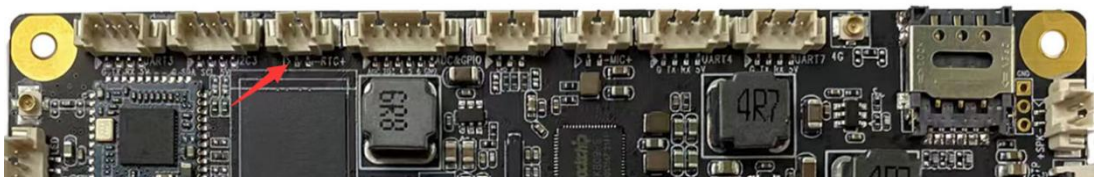
No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX7	Output	Default TTL data output, configurable as RS232
3	RX7	Input	Default TTL data input, configurable as RS232
4	VCC	Power Supply	5V

◆ I2C3 Touch Display Interface (Triangle indicates Pin 1, 4PIN/1.25)

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	GND	Ground	Ground
2	SDA	Input/Output	I2C Data
3	SCL	Output	Clock Signal
4	5V	Output	5V Output

◆ RTC BAT (2PIN/1.25mm)　RTC Battery Interface



No.	Definition	Attribute	Description
1	3V Battery Negative Terminal	Power Supply	3V Battery Negative Terminal
2	3V Battery Positive Terminal	Power Supply	3V Battery Positive Terminal

◆ ADC&GPIO Touch Screen Interface (Triangle indicates Pin 1, 6PIN/1.25)

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	ADKEY IN	Input	ADKEY IN Detection
2	IO	Input/Output	GPIO2_D3_D
3	IO	Input/Output	GPIO2_D4_D
4	IO	Input/Output	GPIO2_D5_D
5	IO	Input/Output	GPIO2_D6_D
6	GND	Ground	GND

◆ External Headphone Interface (Triangle indicates Pin 1, 3PIN/1.25)

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	HP_SNS	Ground	Headphone Ground
2	HPR_OUT	Output	Audio + Signal (Connect to Headphone +)
3	HPL_OUT	Output	Audio - Signal (Connect to Headphone -)

◆ Microphone interface (Triangle indicates Pin 1, 2PIN/1.25)

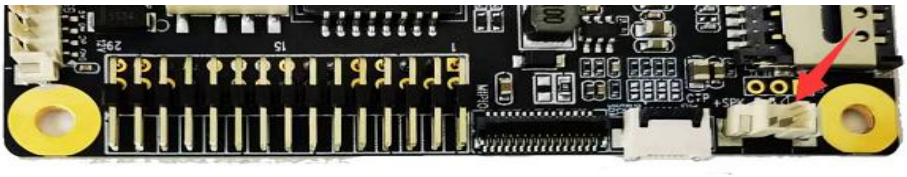
As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description

1	MIC-	Audio Input	Audio Input -
2	MIC+	Audio Input	Audio Input +

◆ Speaker Interface (Triangle direction indicates Pin 1, 2PIN/1.25)

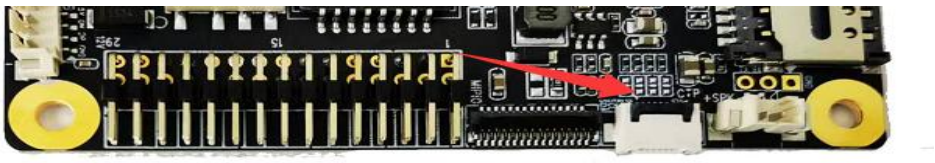
As indicated by the arrow in the figure below.



No.	Definition	Attribute	Description
1	OUTN	Output	Audio - Signal (connects to speaker -)
2	OUTP	Output	Audio + Signal (connects to speaker +)

◆ CTP Touch Screen Interface (Triangle direction indicates Pin 1, 6PIN/0.5)

As indicated by the arrow in the figure below.



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

◆ EXT INTERFACE (Triangle direction indicates Pin 1, 30PIN/2.0)

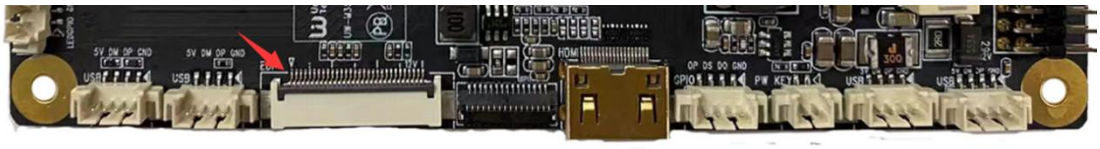
As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	VCC12V_DC_IN	Power Input	12V Input
2	VCC12V_DC_IN	Power Input	12V Input
3	GND	Ground	Ground
4	GND	Ground	Ground
5	UBOOT	Signal Input	Upgrade Button
6	GND	Ground	Ground
7	UART0_RX	Signal In put	Default TTL, configurable as RS485
8	UART0_TX	Signal Out put	Default TTL, configurable as RS485
9	UART5_RX	Signal In put	Default TTL, configurable as RS232
10	UART5_TX	Signal Out put	Default TTL, configurable as RS232
11	NO	Relay Normally Open	Relay Normally Open
12	COM	Relay Common Terminal	Relay Common Terminal
13	WEGIN-D1	DATA Line	Wiegand IN D1
14	WEGIN-D0	DATA Line	Wiegand IN D0
15	WEGOUT-D1	DATA Line	Wiegand OUT D1
16	WEGOUT-D0	DATA Line	Wiegand OUT D0
17	RX+	Ethernet Signal Line	Ethernet Signal Line RX+
18	RX-	Ethernet Signal Line	Ethernet Signal Line RX-
19	TX+	Ethernet Signal Line	Ethernet Signal Line TX+
20	TX-	Ethernet Signal Line	Ethernet Signal Line TX-
21	PJ78	Ground	PoE Power Supply Ground
22	PJ45	Power Supply	PoE Power Supply 12V Input

23	VCC5V0_USB_HOST 1	Power Supply	USB HOST 5V Power Supply
24	VCC5V0_USB_OTG0	Power Supply	USB OTG 5V Power Supply
25	USB3_HOST1DM	USB Signal Line	USB HOST DM
26	USB3_OTG0DM	USB Signal Line	OTG USB DM
27	USB3_HOST1DP	USB Signal Line	USB HOST DP
28	USB3_OTG0DP	USB Signal Line	OTG USB DP
29	GND	Ground	Ground
30	GND	Ground	Ground

◆ eDP Display Interface (Triangle indicates Pin 1, 30PIN/0.5mm)

As indicated by the arrow in the figure below.

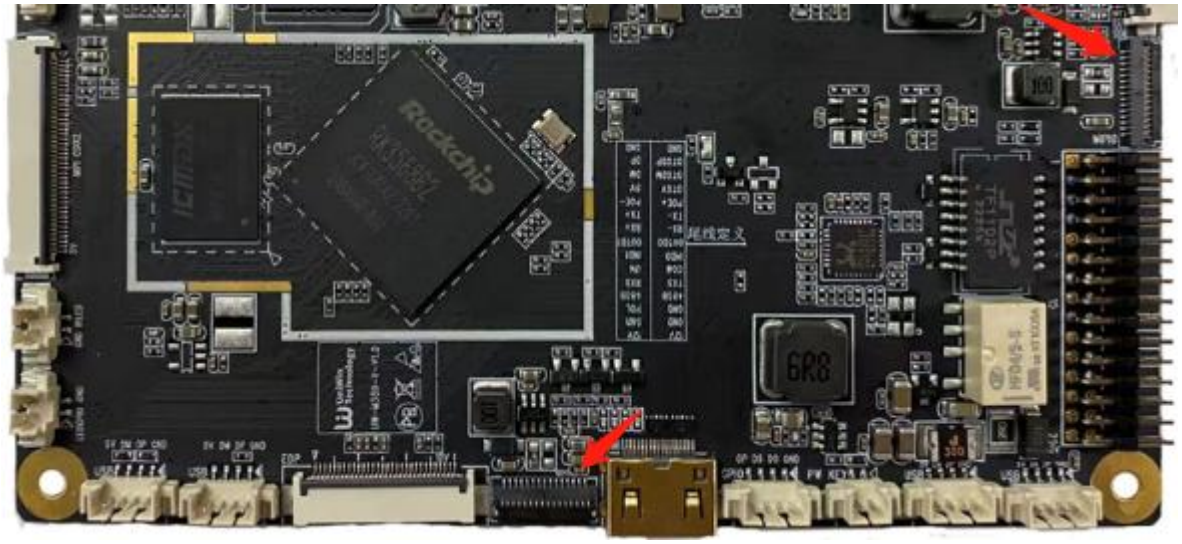


No.	Definition	Attribute	Description
1	NC	NC	NC
2	GND	Ground	Ground
3	DP-D1N	Output	EDP DATA
4	DP-D1P	Output	EDP DATA
5	GND	Ground	Ground
6	DP-D0N	Output	EDP DATA
7	DP-D0P	Output	EDP DATA
8	GND	Ground	Ground
9	DP-CKP	Output	EDP CK
10	DP-CKN	Output	EDP CK
11	GND	Ground	Ground
12	3.3V	Output	3.3V Output
13	3.3V	Output	3.3V Output
14	NC	NC	NC

15	GND	Ground	Ground
16	GND	Ground	Ground
17	HPD	Input	HPD DET
18	GND	Ground	Ground
19	GND	Ground	Ground
20	GND	Ground	Ground
21	GND	Ground	Ground
22	BL-EN	Output	Backlight Enable
23	BL-PWM	Output	Backlight Adjustment
24	NC	NC	NC
25	NC	NC	NC
26	12V	Power Supply	Output
27	12V	Power Supply	Output
28	12V	Power Supply	Output
29	12V	Power Supply	Output
30	NC	NC	NC

◆ MIPI DSI0/1 Display interface (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 Supply	Backlight Power Negative
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

◆ MIPI CAMERA Display interface（Triangle direction indicates Pin 1, 40PIN/0.5mm)

As indicated by the arrow in the figure below.

No.	Definition	Attribute	Description
1	VDD2V8	Power Supply	2.8V Output
2	VDD3V3	Power Supply	3.3V Output
3	IR-PWDN	Output	IR_Camera Power-down Control Signal
4	IR-RST	Output	IR_Camera Reset Signal
5	SCL	Output	SCL Signal
6	SDA	Input/Output	SDA Signal
7	GND	Ground	Ground
8	IR-XCLK	Output	IR_Camera Main Clock
9	GND	Ground	Ground
10	IR-MCP	Input/Output	IR_Camera MIPI Clock Lane Positive
11	IR-MCN	Input/Output	IR_Camera MIPI Clock Lane Negative
12	GND	Ground	Ground
13	IR-D0P	Input/Output	IR_Camera MIPI Data Lane 0 Positive
14	IR-D0N	Input/Output	IR_Camera MIPI Data Channel 0 Negative
15	GND	Ground	Ground

16	IR-D1P	Input/Output	IR_Camera MIPI Data Channel 1 Positive
17	IR-D1N	Input/Output	IR_Camera MIPI Data Channel 1 Negative
18	GND	Ground	Ground
19	DOVDD1V8	Power Supply	1.8V Output
20	FSYC-IN	/	NC
21	LED-GPIO	/	NC
22	IR-DVDD1V2	Power Supply	1.2V Output
23	RGB-DVDD1V2	Power Supply	1.2V Output
24	RGB-PWDN	Output	RGB_Camera Power-down Control Signal
25	RGB-RST	Output	RGB_Camera Reset Signal
26	GND	Ground	Ground
27	RGB-XCLK	Output	RGB_Camera Main Clock
28	GND	Ground	Ground
29	RGB-MCP	Input/Output	RGB_Camera MIPI Clock Channel Positive
30	RGB-MCN	Input/Output	RGB_Camera MIPI Clock Channel Negative
31	GND	Ground	Ground
32	RGB-D0P	Input/Output	RGB_Camera MIPI Data Channel 0 Positive
33	RGB-D0N	Input/Output	RGB_Camera MIPI Data Channel 0 Negative
34	GND	Ground	Ground
35	RGB-D1P	Input/Output	RGB_Camera MIPI Data Channel 1 Positive
36	RGB-D1N	Input/Output	RGB_Camera MIPI Data Channel 1 Negative
37	GND	Ground	Ground
38	5V	Power Supply	5V Output
39	5V	Power Supply	5V Output
40	5V	Power Supply	5V Output

4 Dimensions

4.1 Board Dimensions

PCB Length: 120mm; PCB Width: 75mm; Overall board height approximately 10mm. For more details structural diagrams Please consult our sales representatives.