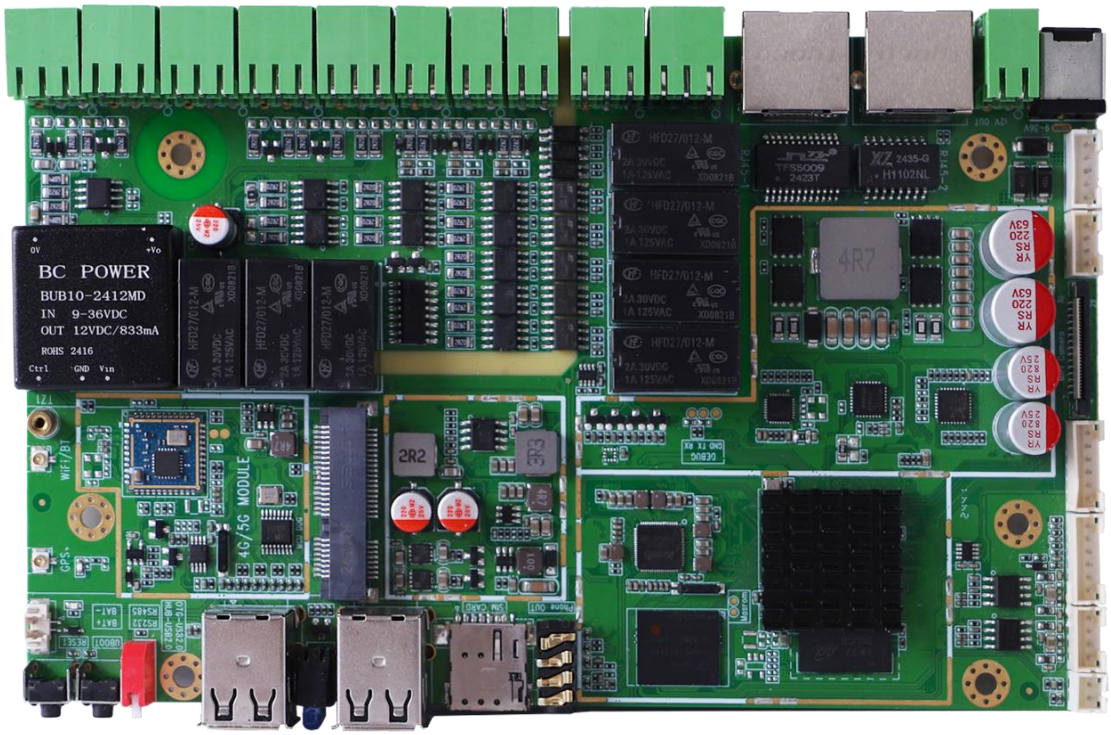
USR-EV908J(RK3562)



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1. Product Overview

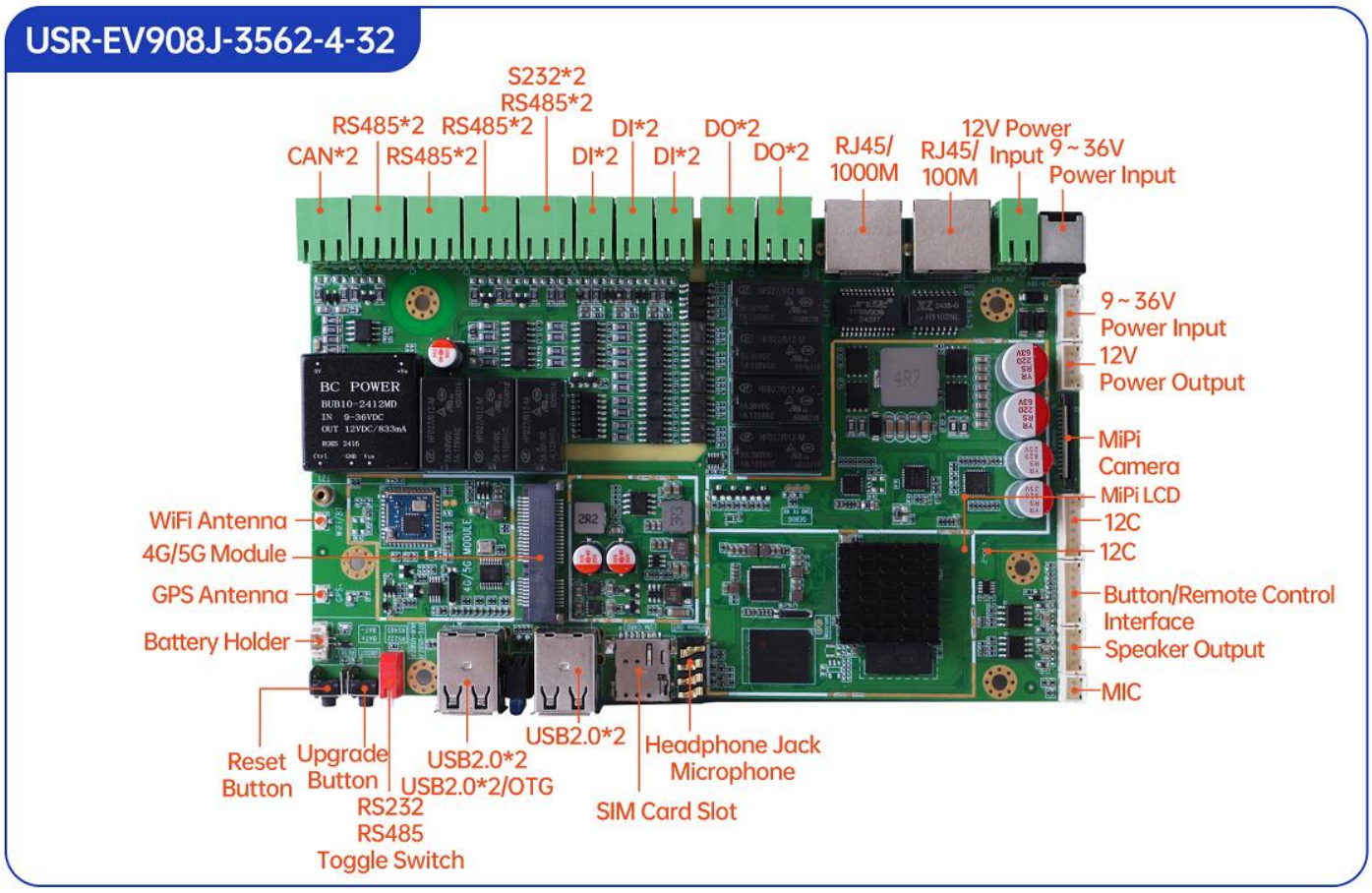
The USR-EV908J-3562 is powered by Rockchip's industrial-grade ARM RK3562J processor running Ubuntu OS. Featuring a quad-core Cortex-A53 architecture manufactured at 22nm process node with 2.0GHz clock speed, it delivers exceptional general-purpose computing capabilities. The integrated Mali-G52 MC3 GPU handles basic graphics processing, while its industrial-grade wide-temperature operation (–40°C to +85°C) ensures stable performance in extreme environments. The motherboard provides MIPI display interface output and supports dual Ethernet, 4G/5G, and Wi-Fi connectivity. Its comprehensive I/O interface includes DI/DO, CAN, RS232, and RS485, with 4000V high-voltage electrical isolation for enhanced interference resistance and security. Additional features include I^2C expansion, USB expansion, gravity sensing, MIPI camera, and infrared remote control. Leveraging platform-based hardware and intelligent design, this motherboard finds applications in automation control, industrial quality inspection, autonomous driving, smart agriculture, intelligent sorting, power systems, security monitoring, medical equipment, smart transportation, financial terminals, industrial control, education, and retail sectors, reliably supporting diverse human-machine interaction and device networking scenarios.

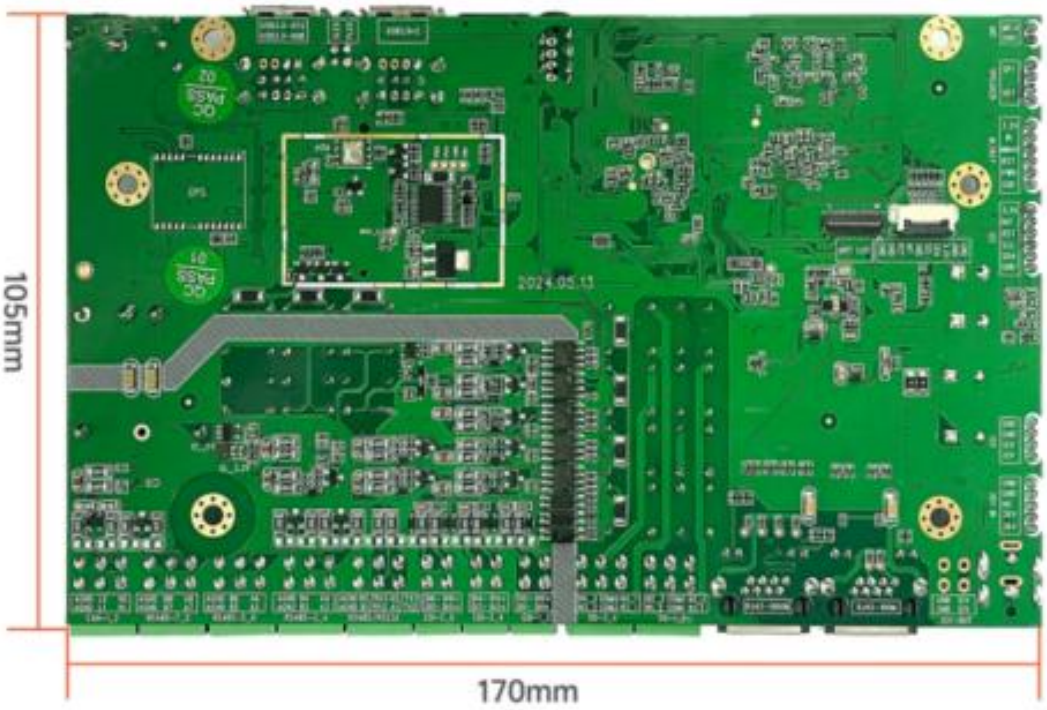
2. Characteristic

- High-performance: The RK3562J is an industrial-grade processor with a wide temperature range of-40 to 85 ° C, featuring a quad-core Cortex-A53 core clocked up to 2.0GHz for exceptional general-purpose computing, and a quad-core Mali-G52 MC3 GPU.
- High Stability: The RK3562J AI motherboard incorporates proprietary technologies in both hardware and software to ensure product stability, enabling the final product to operate 24/7 without human intervention.
- High Integration: The RK3562J AI motherboard utilizes an industrial-grade TG170-8-layer ultra-high-density PCB, integrating dual Ethernet, WiFi, 18W power amplifier, IR remote control, MiPi, microphone, and gravity sensor functions, significantly simplifying overall design. Its ultra-thin design further enhances the aesthetic appeal of the device.
- High expandability: Four USB ports, two CAN ports, two I2C ports, one AD port, six RS485 ports, two RS232/RS485 ports, six DI ports, and four DO ports, supporting expansion of additional peripheral devices.

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3. Product interface





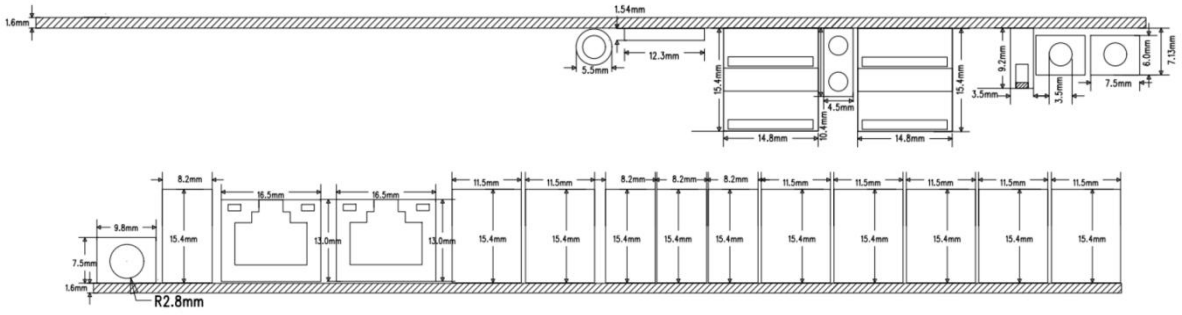
3.1.Hardware specifications

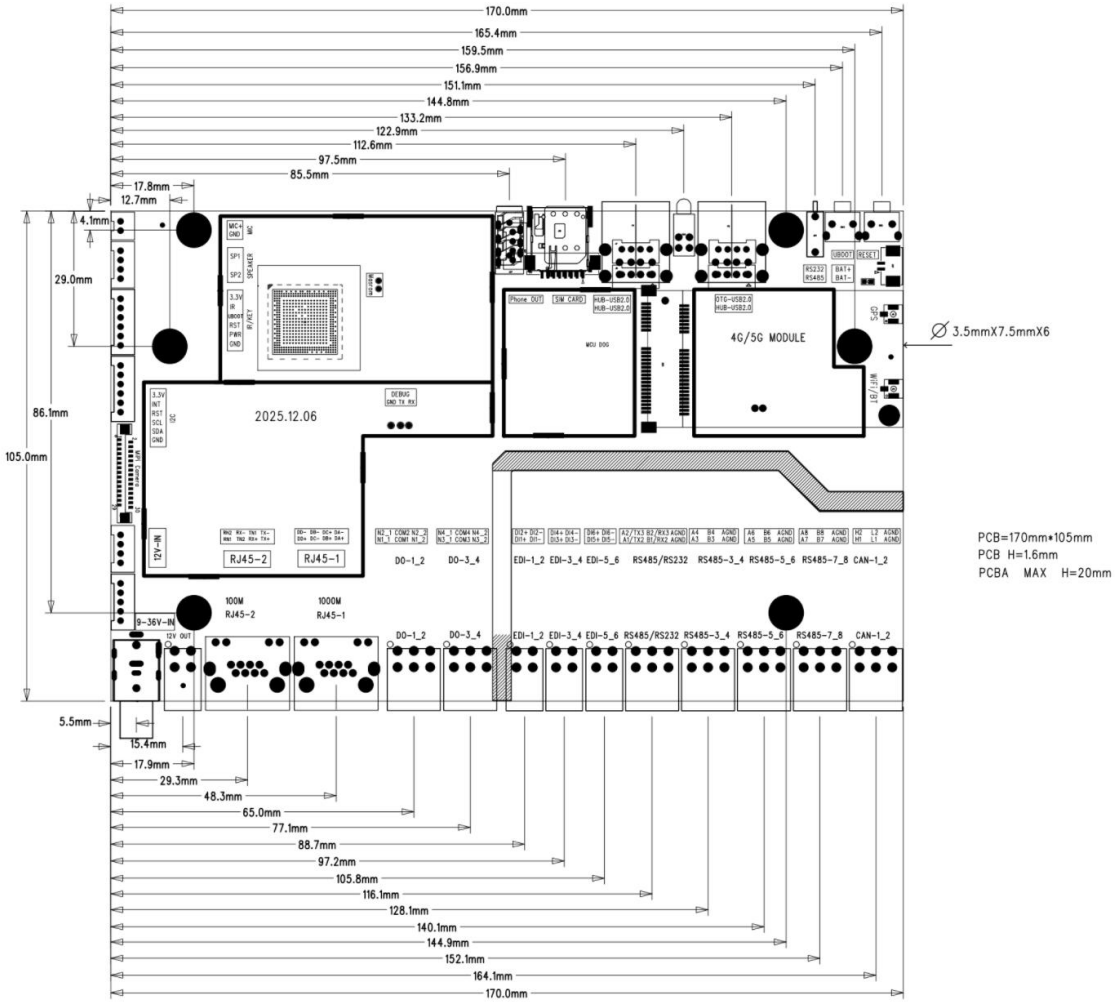
Operating system	Ubuntu20.04/ Android13/Debian11
processor CPU	RK3562J, quad-core Cortex-A53 processor with a maximum clock speed of 2.0GHz
Graphics processing unit GPU	Quad-core Mali-G52 MC3 Supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, and Vulkan 1.1, with built-in high-performance 2D acceleration hardware
Neural Network Processor (NPU)	Built-in 1Tops neural network NPU with support for INT4/INT8/INT16/FP16 operations Supports models such as Caffe, Mxnet, TensorFlow, TF Lite, ONNX, and Darknet Provide AI development component package
Internal storage DDR	LPDDR4 4GB (4G/8G optional)
Memory	eMMC 32GB (available in 32 GB, 64 GB, 128 GB, or 256 GB options)
Network	1 Ethernet port (10/100/1000M) and 1 Ethernet port (10/100M)
	The 2.4GHz band supports WiFi 6 802.11b/g/n standards, with optional 5GHz dual-band support.
	Supports Bluetooth functionality, including V2.1+EDR, Bluetooth 3.0, Bluetooth 3.0+HS, Bluetooth 4.1, and BLE (optional)
	Supports 4G/5G (optional)
GPS navigation	Onboard GPS/BD module (optional)
picture orientation	Supports manual rotation at 0°,90°,180°, and 270°, and gravity-sensing auto-screen rotation (optional)
Display interface	1*MiPi interface (supporting 5.7Gbps output)
audio frequency	1*Speaker output (2*18W 4R) 1* Earpiece output (with earpiece) 1*Microphone input
camera	1* MIPI 4-Lane camera input with 5MP/13MP resolution (optional) Supports USB camera (optional)
I2C	1* I^2C interface
RTC	External real-time clock power battery with on/off timer
USB	3*USB-2.0 HUB , 1*USB2.0 OTG
PCIe	1*Mini PCIe (for 4G/5G LTE)
SIM	1*SIM card slot for Mini PCIe 4G/5G LTE expansion module
infrared	1* Infrared receiver, supports infrared remote control

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LED	1* Power status LED (blue), 1* System LED (green, default flashing)
key	1*Reset button, 1*Power button, 1*Upgrade button
DO mouth	4*DO interface (30V/2A)
DI mouth	6*DI interface (12V/24V compatible)
gorge line	6 RS485 interfaces and 2 RS232/RS485 interfaces (with 4000V isolation capability)
AD mouth	1*AD port
power input	DC9~36V,5A (requires a surge voltage below 50V and ripple voltage below 100mV)
working temperature	-40℃~85℃
storage temperature	-40℃~85℃
storage humidity	10%-80%
Mainboard size	170mm*105mm*20mm
multi-media	Supports 1080P 60fps H.264 video decoding Supports 1080P 60fps H.264 video encoding Supports 13M ISP and HDR
linguistic support	Multilingual
system management	The native Ubuntu system with root access for custom product development
system watchdog	support software watchdog

3.2.structure size



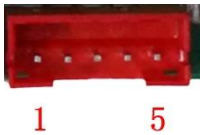


3.3.Source

The 12V OUT ACK power output interface features a 2×3.5mm pin spacing with built-in isolation.

order number	definition	attribute	description	
1	12V_OUT	output	12V power output	
2	GND	earth wire	earth wire	
3	12V_OUT	output	12V power output	
4	GND	earth wire	earth wire	

The power input jack (9V~36V IN JACK) has a socket spacing of 2.0mm.

order number	definition	attribute	description	
1	GND	earth wire	earth wire	
2	GND	earth wire	earth wire	
3	NC	NC	NC	
4	9V~36V_IN	import	9V to 36V power input	
5	9V~36V_IN	import	9V to 36V power input	

The 12V OUT JACK socket has a 2.0mm spacing between its terminals.

order number	definition	attribute	description	
1	GND	earth wire	earth wire	
2	GND	earth wire	earth wire	
3	12V_OUT	output	12V power output	
4	12V_OUT	output	12V power output	

3.4.MiPi Camera

The MiPi Camera JACK interface has a pin spacing of 0.5mm.

order number	definition	attribute	description	
1	NC	barefoot	barefoot	
2	VDD28	source	2.8V output	
3	VDD13	source	1.3V output	
4	VDD18	source	1.8V output	
5	NC	barefoot	barefoot	
6	GND	earth wire	earth wire	
7	VDD28	source	2.8V output	
8	GND	earth wire	earth wire	
9	SDA	output	data	
10	SCL	output	clock	
11	RST	output	reset	
12	PWDN	earth wire	enable bit	
13	GND	earth wire	earth wire	
14	MLCK	output	clock	
15	GND	earth wire	earth wire	
16	DP3	output	data	
17	DN3	output	data	
18	GND	earth wire	earth wire	
19	DP2	output	data	
20	DN2	output	data	
21	GN1	earth wire	earth wire	
22	DP2	output	data	
23	DN1	output	data	
24	GND	earth wire	earth wire	
25	CLKP	output	clock	

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26	CLKN	output	clock	
27	GND	earth wire	earth wire	
28	DP0	output	data	
29	DN0	output	data	
30	GND	earth wire	earth wire	

3.5.I2C

The I2C interface (I2C JACK) has a pin spacing of 2.0mm.

order number	definition	attribute	description	
1	3.3V	output	3.3V voltage output	
2	INT (3.3V level)	import	external device interrupt	
3	RST (3.3V level)	output	External device reset	
4	SCL (3.3V level)	output	clock	
5	SDA (3.3V level)	output	data	
6	GND	earth wire	earth wire	

3.6.Button/Remote

The LED/IR IN JACK interface has a key/remote receiver with a 2.0mm socket spacing.

order number	definition	attribute	description	
1	3.3V	output	3.3V voltage output	
2	IR	import	receive	
3	UBOOT	output	Upgrade key	
4	RST	output	RESET button	
5	PWR	output	POWER power button	
6	GND	earth wire	earth wire	

3.7.suona

The speaker output jack socket spacing is 2.0mm.

order number	definition	attribute	description

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1	LP	output	positive output of left channel	
2	LN	output	Left channel output negative pole	
3	RP	output	Right channel output positive	
4	RN	output	Right channel output negative pole	

3.8.microphone

The microphone jack socket spacing is 2.0mm.

order number	definition	attribute	description	
1	MIC+	import	MIC positive input	
2	GND	import	earth wire	

3.9.RTC

3V button battery socket (BAT JACK) with 1.25mm spacing

order number	definition	attribute	description	
1	BAT+	import	3V input	
2	GND	import	earth wire	

3.10. CAN

The CAN interface jack features a 2×3.5mm socket spacing with built-in isolation.

order number	definition	attribute	description	
1	CANH1	data	data	
2	CANL1	data	data	
3	AGND	simulated ground	simulated ground	
4	CANH2	data	data	

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5	CANL2	data	data	
6	AGND	simulated ground	simulated ground	

3.11. RS485

RS485 interface jack with 2×3.5mm pin spacing (interface with isolation)

order number	definition	attribute	description	
1	RS485-A7	data	Data (ttyS8)	
2	RS485-B7	data	Data (ttyS8)	
3	AGND	simulated ground	simulated ground	
4	RS485-A8	data	Data (ttyS9)	
5	RS485-B8	data	Data (ttyS9)	
6	AGND	simulated ground	simulated ground	

RS485 interface jack with 2×3.5mm pin spacing (interface with isolation)

order number	definition	attribute	description	
1	RS485-A5	data	Data (ttyS6)	
2	RS485-B5	data	Data (ttyS6)	
3	AGND	simulated ground	simulated ground	
4	RS485-A6	data	Data (ttyS7)	
5	RS485-B6	data	Data (ttyS7)	
6	AGND	simulated ground	simulated ground	

RS485 interface jack with 2×3.5mm pin spacing (interface with isolation)

order number	definition	attribute	description	
1	RS485-A3	data	Data (ttyS4)	
2	RS485-B3	data	Data (ttyS4)	
3	AGND	simulated ground	simulated ground	
4	RS485-A4	data	Data (ttyS5)	
5	RS485-B4	data	Data (ttyS5)	

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6	AGND	simulated ground	simulated ground	

RS485/RS232 interface (RS485/RS232 jack) with 2×3.5mm pin spacing (interface with isolation)

order number	definition	attribute	description	
1	RS485-A1/TX2	data	Data (ttyS2)	
2	RS485-B1/RX2	data	Data (ttyS2)	
3	AGND	simulated ground	simulated ground	
4	RS485-A2/TX3	data	Data (ttyS3)	
5	RS485-B2/RX3	data	Data (ttyS3)	
6	AGND	simulated ground	simulated ground	

3.12. DI

DI JACK socket spacing: 2×3.5mm (with isolation)

order number	definition	attribute	description	
1	DI5+	data	data	
2	DI5-	data	data	
3	DI6+	data	data	
4	DI6-	data	data	

DI JACK socket spacing: 2×3.5mm (with isolation)

order number	definition	attribute	description	
1	DI3+	data	data	
2	DI3-	data	data	
3	DI4+	data	data	
4	DI4-	data	data	

DI JACK socket spacing: 2×3.5mm (with isolation)

order number	definition	attribute	description	
1	DI1+	data	data	
2	DI1-	data	data	
3	DI2+	data	data	

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4	DI2-	data	data	

3.13. DO

DO JACK with 2×3.5mm pin spacing (interface with isolation)

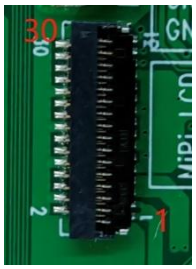
order number	definition	attribute	description	
1	N3-1	data	data	
2	COM3	data	data	
3	N3-2	data	data	
4	N4-1	data	data	
5	COM4	data	data	
6	N4-2	data	data	

DO JACK with 2×3.5mm pin spacing (interface with isolation)

order number	definition	attribute	description	
1	N1-1	data	data	
2	COM1	data	data	
3	N1-2	data	data	
4	N2-1	data	data	
5	COM2	data	data	
6	N2-2	data	data	

3.14. FPC MiPi LCD

FPC MiPi LCD jack with 0.3mm spacing between sockets (bottom layer)

order number	definition	attribute	description	
1	LED+	output	backlight anode	
2	LED+			
3	LED+			
4	GND	earth wire	earth wire	
5	LED-	output	backlight anode	
6	LED-			
7	LED-			
8	LED-			
9	GND	earth wire	earth wire	
10	GND			
11	MiPi2+	output	data	

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12	MiPi 2-	output	data	
13	GND	earth wire	earth wire	
14	MiPi 1+	output	data	
15	MiPi 1-	output	data	
16	GND	earth wire	earth wire	
17	MiPi CLK+	output	clock	
18	MiPi CLK-	output	clock	
19	GND	earth wire	earth wire	
20	MiPi 0+	output	data	
21	MiPi 0-	output	data	
22	GND	earth wire	earth wire	
23	MiPi 3+	output	data	
24	MiPi 3-	output	data	
25	GND	earth wire	earth wire	
26	NC	NC	NC	
27	RESET	output	reset	
28	NC	NC	NC	
29	VDDIO1.8V	output	VDD1.8V	
30	VDD3.3V	output	VDD3.3V	
31	VDD3.3V	output	VDD3.3V	

3.15. FPC I2C

FPC I2C interface (I2C JACK) with 0.5mm spacing between sockets (bottom layer)

order number	definition	attribute	description	
1	GND	earth wire	earth wire	
2	GND	earth wire	earth wire	
3	3.3V	output	3.3V voltage output	
4	SDA (3.3V level)	output	data	
5	SCL (3.3V level)	output	clock	
6	GND	earth wire	earth wire	
7	INT (3.3V level)	import	external device interrupt	
8	RST (3.3V level)	output	External device reset	
9	GND	earth wire	earth wire	
10	GND	earth wire	earth wire	



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