



AIO-3399J

All In One Board Specifications

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V1.0	2017-09-29	Original version
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Company Profile

T-Chip Intelligent Technology Co., Ltd. was founded in 2005. It has more than 10 years of research and development experience in scientific and technological products, has 6 invention patents and more than 30 computer software copyrights, and is a national high-tech enterprise. We focus on the research and development, design, production and sales of open source intelligent hardware, internet of things and digital audio products, and provide the overall solution for intelligent hardware products meanwhile.



Firefly is a brand owned by T-chip Technology. It operates open source products, open source communities and online stores. It has a large number of enterprise users and developer users, and its products are well received by users. Firefly open source products include open source boards, core boards, industry mainboards, etc. The open-source board series is the recommended board card by chip original factory Rockchip and obtain the support of native SDK. The core boards and industrial mainboards are widely used in commercial displays, advertisement integrated machines, intelligent POS, face recognition terminals, internet of things, intelligent cities, etc. At present, there are more than 100,000 users, including over 2,000 enterprise users. And well-known users include ARM, Google, Baidu, Tencent, Alibaba, etc.

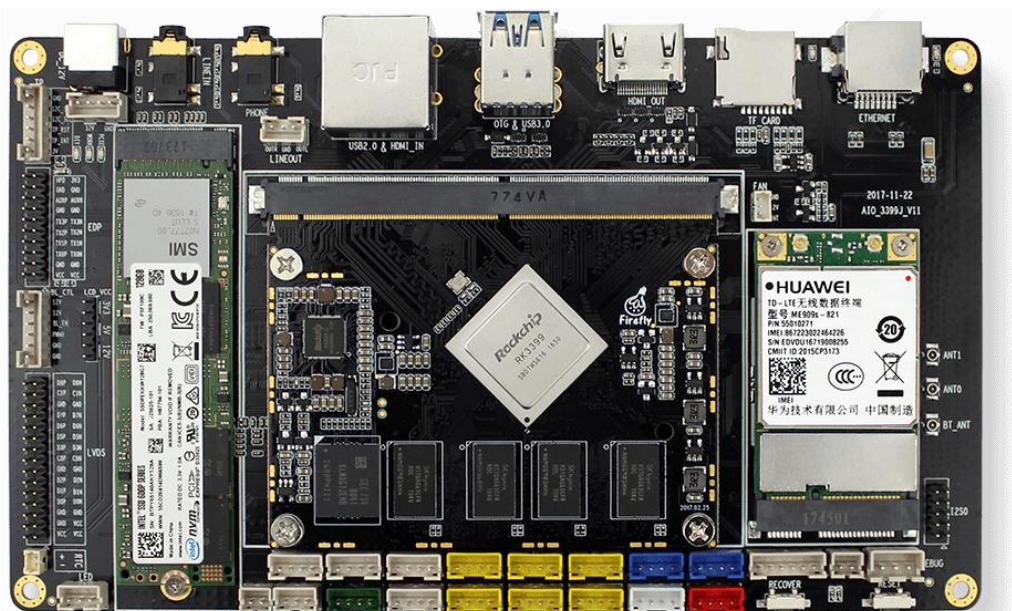
Firefly team has more than 60 research and development members and has the research and development capabilities in schematic design, PCB layout, mainboard production, embedded development, system development, application program development, etc., which accelerates the research and development process for many technology entrepreneurs and start-ups, and provides professional technical services..

" **Make technology more simple, Make life more intelligent** " is the idea of Firefly team. We hope to make the research and development of various technology products efficient and simple, and let intelligent technology integrate in our lives through the open source products and technical services of Firefly.

1. Product Overview

1.1 Overview









AIO-3399J integrated board is based on the RK3399 six-core chip platform, dual Cortex-A72 big core + quad Cortex-A53 small core, basic frequency of 2GHz and quad-core Mali-T860 GPU. The chip performance is powerful. The board has dual LVDS, MIPI, EDP, HDMI display output interfaces, built-in universal backlight interface and screen voltage jumper wires, which can be compatible with more types of display screen.



The board is integrated with MINI PCIE connector and SIM holder, which can be connected to 3G and 4G mobile communication modules. It has PCIE M.2 MKey interface and can be directly connected to SSD and other accessories. The board is integrated with 6-channel UART port, including RS232 and RS485 interfaces, which is convenient to be connected to various industrial equipments.

Android (Linux / Ubuntu) system is supported and software support is perfect. The open source code is fit for secondary development of enterprises and it is applicable for High performance computing/storage, computer vision, Amusement equipment, Commercial display advertising machines, Medical/health equipment, Vending machines, mobile POS machines, and Interactive printer, which can reduce the threshold for research and development and shorten the product development cycle.

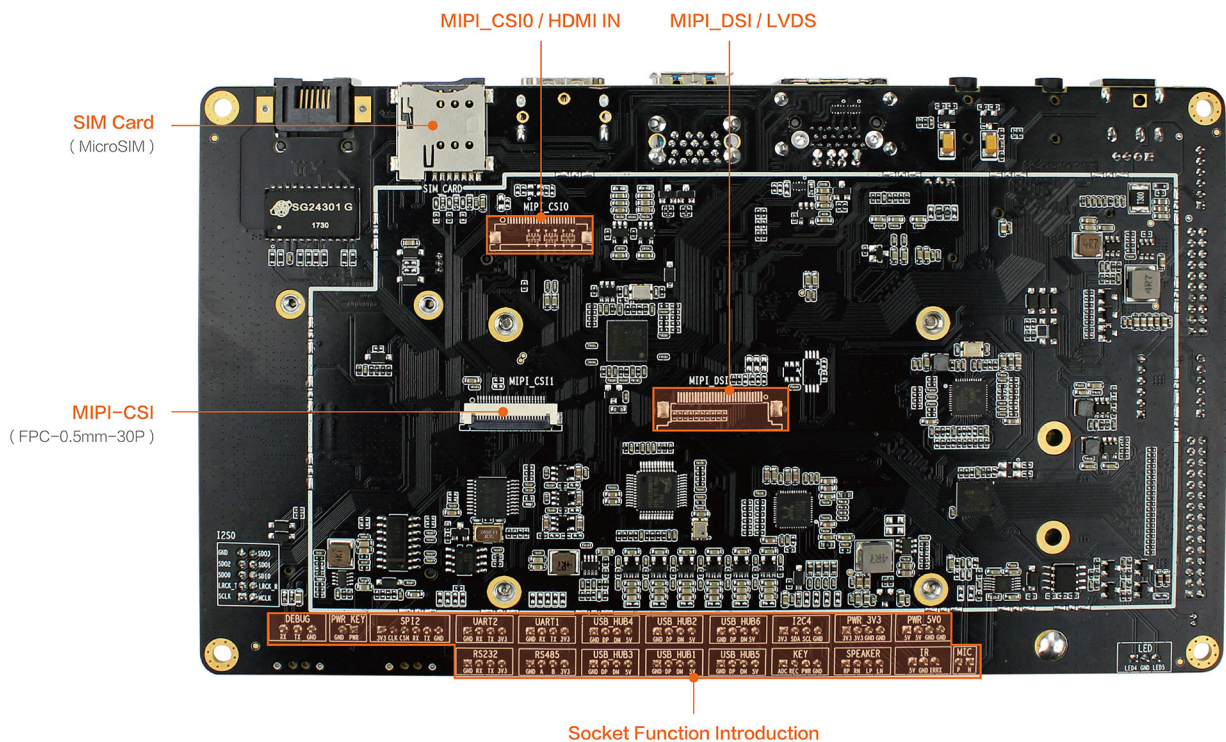
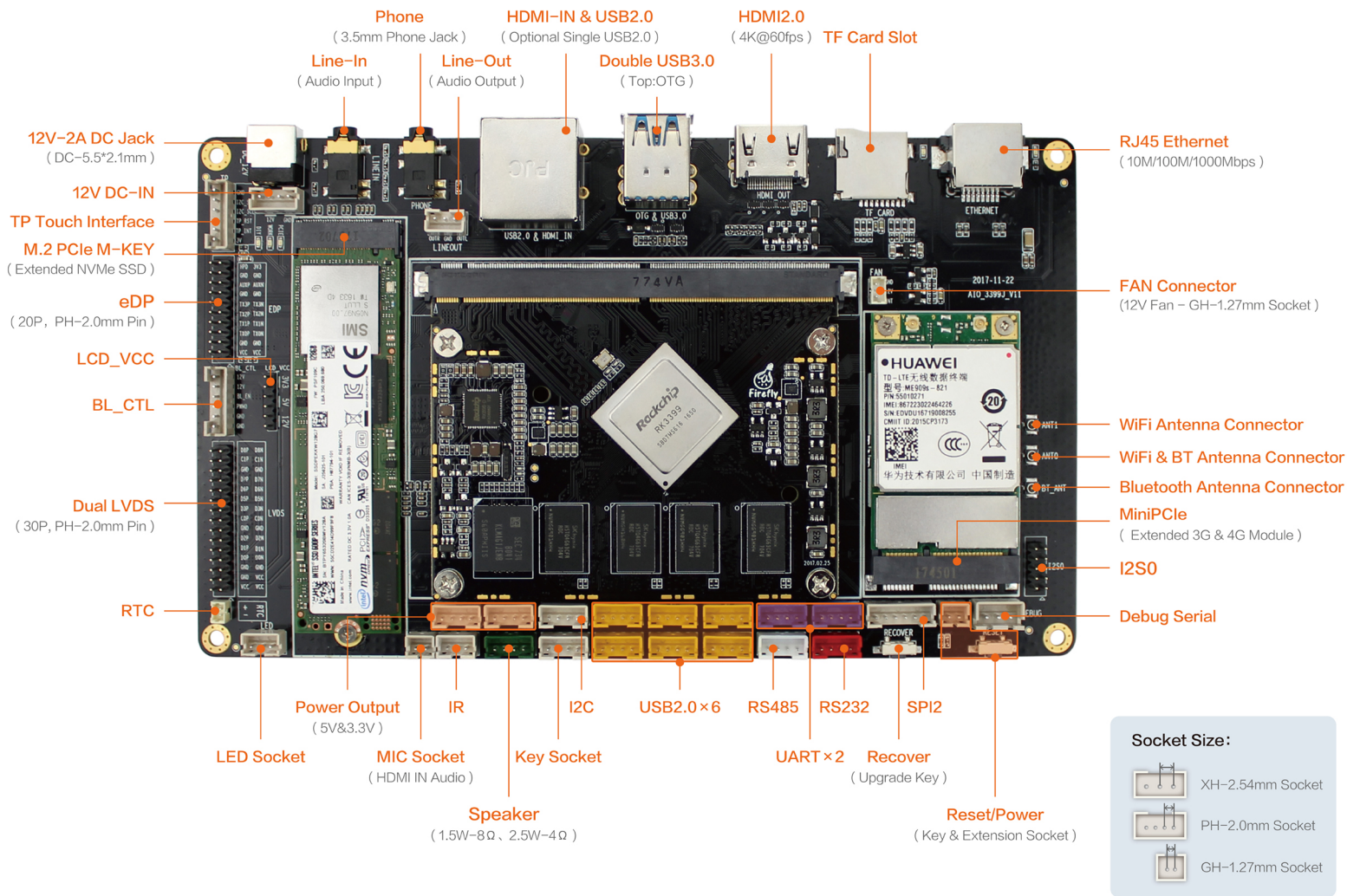
1.2 Application Scenarios

			
High performance computing / storage	computer vision	Amusement equipment	Commercial display advertising machines
			
Medical / health equipment	Vending machines	mobile POS machines	Interactive printer

1.3 Features

- Multi-channel display interfaces: multiple display output interfaces of **dual LVDS**, EDP and HDMI. Support dual-screen identical display/dual-screen differential display.
- Rich extension interfaces: support PWM、SPI、UART、ADC、I2C、I2S、GPIO extension interface, and **support RS232 and RS485 interfaces meanwhile**.
- Multiple network interfaces: 2.4GHz/5GHz dual-frequency WiFi, support 802.11a/b/g/n/ac protocols. Gigabit ethernet interface onboard. It can connect MINI PCIE interface and expand 3G/4G mobile communication functions.
- Perfect system software: support open source operating systems such as Android, Linux, Ubuntu.

1.4 Front and Back View of Product





2. Hardware Specifications

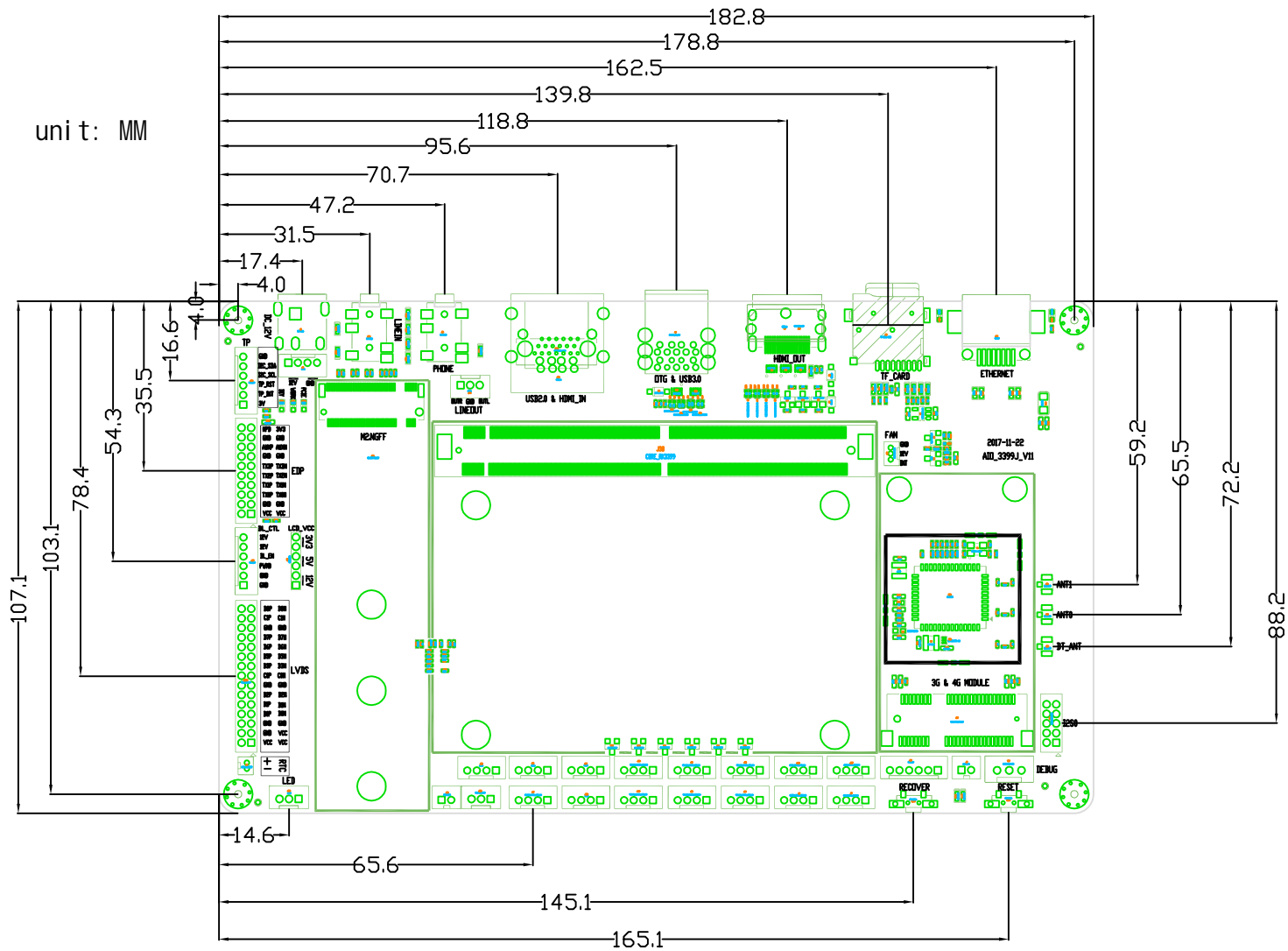
Types	Specification parameters
CPU	RK3399, dual Cortex-A72 big core + quad Cortex-A53 small core. The highest basic frequency is 2.0 GHz.
GPU	Quad core ARM Mali-T860 Support OpenGL ES 1.1/2.0 /3.0, OpenVG1.1, OpenCL, Directx11
DDR	2GB / 4GB (Optional)
Memory	Support eMMC5.1, SDIO3.0 8GB/16GB/32GB/64G/128G (Optional)
Operating system	Android 7.1、Linux、Ubuntu
Decoding resolution /multimedia	Video decoding, up to 60fps 1080P multi-format video decoding (VC-1, MPEG-1/2/4, VP8) 1080P video coding, support H.264, VP8 format Video post processor: anti-interlacing, de-noising, edge/detail/color optimization
Display	Dual VOP display: support resolution respectively 4096X2160 and 2560X1600 Dual-channel MIPI-DSI (4 lines per channel) HDMI2.0 support 4K 60Hz display, support HDCP 1.4/2.2 DisplayPort 1.2 (4 lines, support up to 4K 60Hz) eDP 1.3 (4 lines, 10.8Gbps) Rec.2020 and Rec.709 color gamut conversion
Interface	Dual ISP pixel processing capability up to 13MPix/s, support simultaneous input of dual channel camera data USB3.0 HOST, and Type-C interface Support PCIe 1.0 (4 full-duplex lanes)

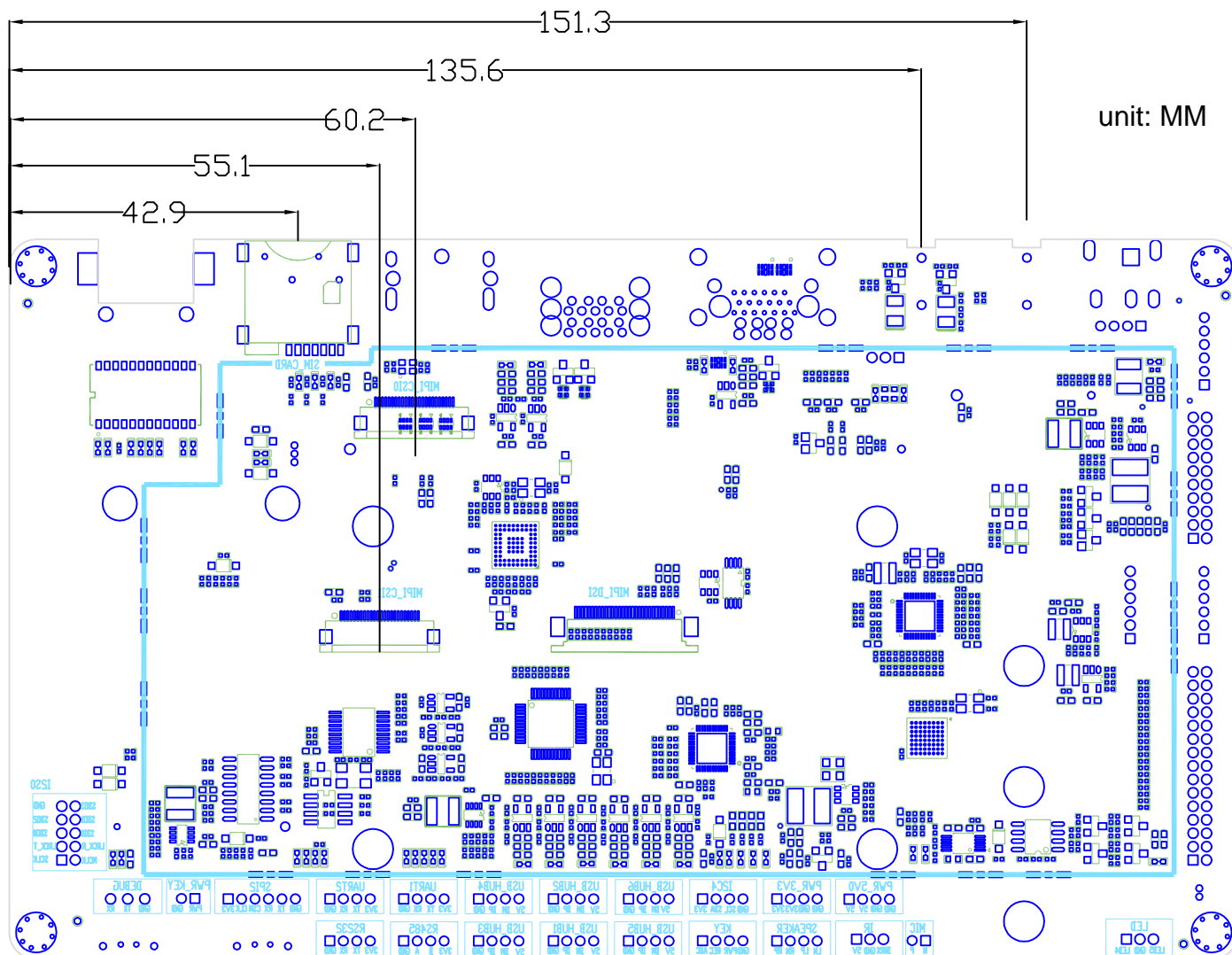


	Built-in low power MCU
	8-Channel digital microphone array input
Network support	RJ45 interface gigabit ethernet
	Support 2.4GHz/5GHz dual-frequency WiFi, support 802.11a/b/g/n/ac protocols, Support Bluetooth 4.0
3G	Built-in WCDMA,EVDO,4G universal version, support voice calls
SD card	Support SD card
LVDS	A single/dual channel, directly drive 50/60Hz LCD screen
eDP	Directly drive eDP interface LCD screen with multiple resolution
HDMI output	Support 1080P@120Hz, 4K2K@60Hz output
HDMI input	Support 1080P@30Hz collection
Audio output	Built-in dual channel amplifier, maximum power
RTC	Support real time clock
Timing switch	Support
USB	1×OTG 3.0, 1×HOST 3.0, 6×USB2.0, 1×HOST2.0
Serial port	2×RS232, 3×TTL, 1×RS485
Infrared receiver	One channel infrared receiver, support infrared remote control function
Input power	12/2A
Size	182.8MM x 107.1MM
Thickness of board	1.6MM
Height limit of top surface	18.5 MM
Height limit of bottom surface	4.5MM
Screw hole size	3.0MM

3、 PCB Size

unit: MM







4. Interface definition

4.1 eDP

NO.	Definition	Attribute	Description
1	VCC_LCD	Power output	3.3V/5V/12V Determined by jumper wire position
2	VCC_LCD	Power output	3.3V/5V/12V Determined by jumper wire position
3	GND1	GND	GND
4	GND2	GND	GND
5	EDP_TX0N	Signal output	EDP data channel 0 negative
6	EDP_TX0P	Signal output	EDP data channel 0 positive
7	EDP_TX1N	Signal output	EDP data channel 1 negative
8	EDP_TX1P	Signal output	EDP data channel 1 positive
9	EDP_TX2N	Signal output	EDP data channel 2 negative
10	EDP_TX2P	Signal output	EDP data channel 2 positive
11	EDP_TX3N	Signal output	EDP data channel 3 negative
12	EDP_TX3P	Signal output	EDP data channel 3 positive
13	GND3	GND	GND
14	GND4	GND	GND
15	EDP_AUXN	Signal output	EDP accessory channel negative
16	EDP_AUXP	Signal output	EDP accessory channel positive
17	GND5	GND	GND
18	GND6	GND	GND
19	VCC_3V0	Power output	3.3VOutput
20	LCD_HPDP	Input/output	GPIO Input/output



4.2 MIPI

NO.	Definition	Attribute	Description
1	VCC_SYS	Power output	Output5V
2	CIF_PWR	Output	Camera control foot
3	DVP_PWR	Output	Camera control foot
4	I2C1_SDA_CAM	Output	Output I2C1 data signal
5	I2C1_SCL_CAM	Output	Output I2C1 clock signal
6	MIPI_RST	Output	MIPI reset signal
7	GPIO2_B0/DVP_PDN0_H	Output	Camera control foot
8	GND	GND	GND
9	MIPI_MCLK0	Output	MIPI clock signal
10	GND	GND	
11	MIPI_TX1/RX1_D3P	Output	MIPI data channel 3 positive
12	MIPI_TX1/RX1_D3N	Output	MIPI data channel 3 negative
13	GND	GND	GND
14	MIPI_TX1/RX1_D2P	Output	MIPI data channel 2 positive
15	MIPI_TX1/RX1_D2N	Output	MIPI data channel 2 negative
16	GND	GND	GND
17	MIPI_TX1/RX1_CLKP	Output	MIPI clock channel positive
18	MIPI_TX1/RX1_CLKN	Output	MIPI clock channel negative
19	GND	GND	GND
20	MIPI_TX1/RX1_D1P	Output	MIPI data channel 1 positive
21	MIPI_TX1/RX1_D1N	Output	MIPI data channel 1 negative
22	GND	GND	GND
23	MIPI_TX1/RX1_D0P	Output	MIPI data channel 0 positive
24	MIPI_TX1/RX1_D0N	Output	MIPI data channel 0 negative



4.3 LVDS

NO.	Definition	Attribute	Description
1	VCC_LCD	Power output	LCD power output +3V/+5V/+12V optional
2	VCC_LCD	Power output	LCD power output +3V/+5V/+12V optional
3	VCC_LCD	Power output	LCD power output +3V/+5V/+12V optional
4	GND	GND	GND
5	GND	GND	GND
6	GND	GND	GND
7	LVDS_D0N	Output	LVDS data channel 0 negative
8	LVDS_D0P	Output	LVDS data channel 0 positive
9	LVDS_D1N	Output	LVDS data channel 1 negative
10	LVDS_D1P	Output	LVDS data channel 1 positive
11	LVDS_D2N	Output	LVDS data channel 2 negative
12	LVDS_D2P	Output	LVDS data channel 2 positive
13	GND	GND	GND
14	GND	GND	GND
15	LVDS_CLK0N	Output	LVDS clock channel 0 negative
16	LVDS_CLK0P	Output	LVDS clock channel 0 positive
17	LVDS_D3N	Output	LVDS data channel 3 negative
18	LVDS_D3P	Output	LVDS data channel 3 positive
19	LVDS_D5N	Output	LVDS data channel 5 negative
20	LVDS_D5P	Output	LVDS data channel 5 positive
21	LVDS_D6N	Output	LVDS data channel 6 negative
22	LVDS_D6P	Output	LVDS data channel 6 positive
23	LVDS_D7N	Output	LVDS data channel 7 negative
24	LVDS_D7P	Output	LVDS data channel 7 positive
25	GND	GND	GND
26	GND	GND	GND
27	LVDS_CLK1N	Output	LVDS clock channel 0 negative
28	LVDS_CLK1P	Output	LVDS clock channel 0 positive
29	LVDS_D8N	Output	LVDS data channel 8 negative
30	LVDS_D8P	Output	LVDS data channel 8 positive



4.4 BL_CTL

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	GND	GND	GND
3	LCD_BL_PWM	Output	Output PWM signal
4	BL_EN	Output	Output backlight enabling signal
5	12V	Power output	Output 12V
6	12V	Power output	Output 12V

4.5 LCD_PWR

NO.	Definition	Attribute	Description
1	12V	Power output	Output 12V
2	VCC_LCD	Output power	Output LCD power
3	VCC_SYS	Power output	Output5V
4	VCC_LCD	Power output	Output LCD power
5	VCC3V3_SYS	Power output	Output3.3V
6	VCC_LCD	Power output	Output LCD power

4.6 LED

NO.	Definition	Attribute	Description
1	LED4	Output	Output indicator lamp signal
2	GND	GND	GND
3	LED5	Output	Output indicator lamp signal

4.7 MIC

NO.	Definition	Attribute	Description
1	MICIN-N	Output	Output MIC signal negative
2	MICIN-p	Output	Output MIC signal positive



4.8 PWR_5V

NO.	Definition	Attribute	Description
1	VCC_SYS	Power output	Output 5V
2	VCC_SYS	Power output	Output 5V
3	GND	GND	GND
4	GND	GND	GND

4.9 IR

NO.	Definition	Attribute	Description
1	IR_VCC	Power output	Output 5V
2	GND	GND	GND
3	IRRX	Output	Output IR sending signal

4.10 PWR_3V3

NO.	Definition	Attribute	Description
1	VCC3V3_SYS	Power output	Output 3.3V
2	VCC3V3_SYS	Power output	Output 3.3V
3	GND	GND	GND
4	GND	GND	GND

4.11 SPK

NO.	Definition	Attribute	Description
1	SPK_RN	Output	Output R- audio signal
2	SPK_RP	Output	Output R+ audio signal
3	SPK_LN	Output	Output L- audio signal
4	SPK_LP	Output	Output L+ audio signal



4.12 I2C4

NO.	Definition	Attribute	Description
1	VCC_3V3_SYS	Power output	Output 3.3V
2	I2C4_SDA	Output	Output I2C4 data signal
3	I2C4_SCL	Output	Output I2C4 clock signal
4	GND	GND	GND

4.13 KEY

NO.	Definition	Attribute	Description
1	ADC_IN0	Output	Output ADC signal
2	RECOVER_KEY	Output	Output RECOVER signal
3	PWR_ON	Output	Output PWR_ON signal
4	GND	GND	GND

4.14 HUB_USB6

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP6	Output	DP signal
3	HUB_DM6	Output	DM signal
4	VCC5V0_HOST6	Power output	Output 5V

4.15 HUB_USB5

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP5	Output	DP signal
3	HUB_DM5	Output	DM signal
4	VCC5V0_HOST5	Power output	Output 5V



4.16 HUB_USB2

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP2	Output	DP signal
3	HUB_DM2	Output	DM signal
4	VCC5V0_HOST2	Power output	Output 5V

4.17 HUB_USB1

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP1	Output	DP signal
3	HUB_DM1	Output	DM signal
4	VCC5V0_HOST1	Power output	Output 5V

4.18 HUB_USB4

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP4	Output	DP signal
3	HUB_DM4	Output	DM signal
4	VCC5V0_HOST4	Power output	Output 5V

4.19 HUB_USB3

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	HUB_DP3	Output	DP signal
3	HUB_DM3	Output	DM signal
4	VCC5V0_HOST3	Power output	Output 5V



4.20 UART

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	RXD	Output	RXD signal
3	TXD	Output	TXD signal
4	VCC3V3_UART	Power output	Output 3.3V

4.21 RS485

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	RS485 A	Output	Output RS485 A signal
3	RS485 B	Output	Output RS485 B signal
4	VCC3V3_UART	Power output	Output 3.3V

4.22 UART

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	RX_C	Output	RX_C signal
3	TX_C	Output	TX_C signal
4	VCC3V3_UART	Power output	Output 3.3V

4.23 RS232

NO.	Definition	Attribute	Description
1	GND	GND	GND
2	RS232_RX	Output	RX signal
3	RS232_TX	Output	TX signal
4	VCC3V3_UART	Power output	Output 3.3V



4.24 SPI

NO.	Definition	Attribute	Description
1	VCC3V3_SYS	Power output	Output 3.3V
2	GPIO2_B3/SPI2_CLK	Output	Output SPI clock signal
3	GPIO2_B4/SPI2_CSN0	Output	Output SPI2_CSN0 signal
4	GPIO2_B1/SPI2_RXD	Output	Output SPI2_RXD signal
5	GPIO2_B2/SPI2_TXD	Output	Output SPI2_TXD signal
6	GND	GND	GND

4.25 I2S

NO.	Definition	Attribute	Description
1	I2S0_SCLK	Output	I2S clock signal
2	I2S0_CLK	Output	I2S clock signal
3	I2S0_LRCK_TX	Output	I2S clock signal
4	I2S0_LRCK_RX	Output	I2S clock signal
5	I2S0_SDO0	Output	I2S data channel 0
6	I2S0_SDI0	Output	I2S data signal
7	I2S0_SDO2	Output	I2S data channel 2
8	I2S0_SDO1	Output	I2S data channel 1
9	GND	GND	GND
10	I2S0_SDO3	Output	I2S data channel 3

4.26 UART2

NO.	Definition	Attribute	Description
1	UART2_RXD	Output	Output UART2_RXD signal
2	UART2_TXD	Output	Output UART2_TXD signal
3	GND	GND	GND



4.27 LINE_OUT

NO.	Definition	Attribute	Description
1	LINE_OUT_R	Output	Right sound channel output
2	GND	GND	GND
3	LINE_OUT_L	Output	Left sound channel output

4.28 DC12V

NO.	Definition	Attribute	Description
1	DCIN	Power input	Input 12V power (power supply)
2	DCIN	Power input	Input 12V power (power supply)
3	GND	GND	GND
4	GND	GND	GND

4.29 RTC

NO.	Definition	Attribute	Description
1	VCC_RTC	Battery input	Input 3.3V
2	GND	GND	GND

Appendix

1 Source code acquisition

Please visit the official website "Resource Download": ([please click here](#))

2 Contact us

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