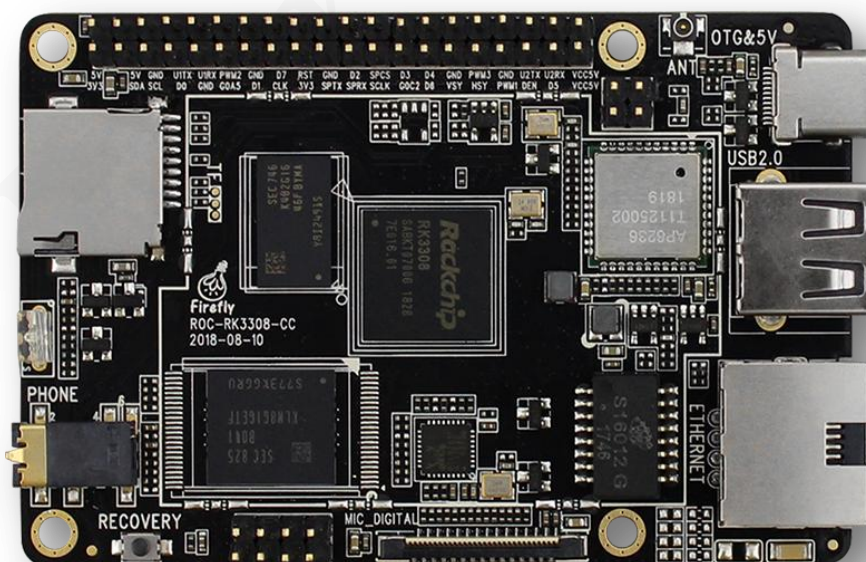




T-Chip technology

ROC-RK3308-CC

Specifications V1.0



Version	Date	Updated content
V1.0	2018-10-15	Original version



Directory

1. Product Overview	4
1.1 Overview	4
2. Interface description	6
3. Hardware Specifications	7
4. PCB Size	8
5. Interface definition	9
1、J9911	9
2、J9910	11
6. Appendix	12
1 .Source code acquisition	12
2. Contact us	12

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.

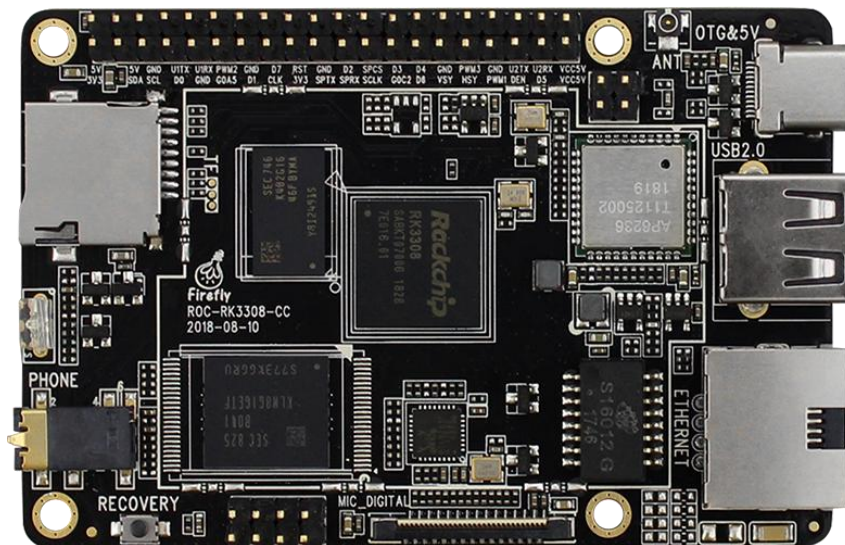
Firefly team has more than 60 research and development members and has the research and development capabilities in schematic design, PCB layout, mainboard production, embedded development, system development, application program development, etc., which accelerates the research and development process 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

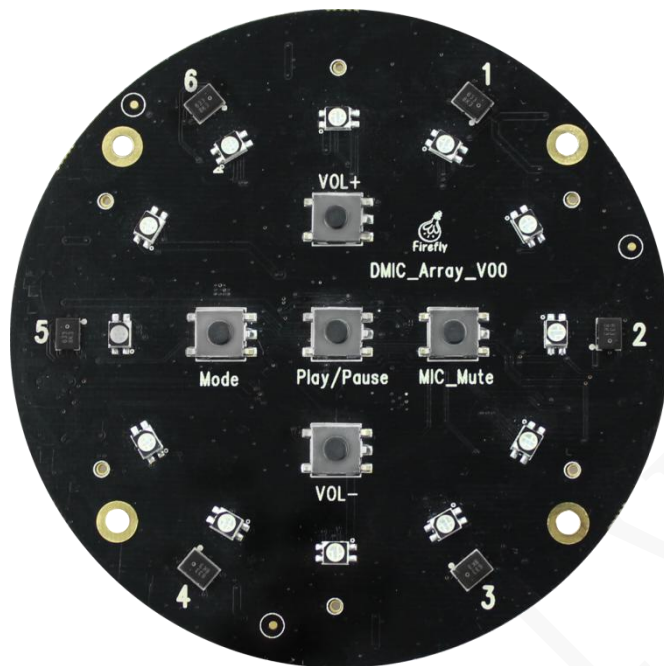
It is a miniature and compact main board which is equipped with a cost-effective RK3308 Core Processor and a high-performance CODEC. It can support various artificial intelligence and IOT operating systems, and can be configured with six microphone array board and POE expansion board. ROC-RK3308-CC is a kind of AI+IOT open source main board incorporating many kinds of functions.



It's equipped with cost-effective RK3308 64-Bit Quad-Core ARM Cortex-A35 processor, frequency up to 1.3GHz, and with high-performance CODEC and VAD, which can be used for development of the smart audio solution, automatic speech recognition, etc.

ROC-RK3308-CC supports the Buildroot system now and is about to support ROS, AliOS Things and other operating systems. The voice service function supports three-voice suits: Baidu DuerOS, AISpeech, iFLYTEK, and will support Amazon Alexa later. Rich operating system/service support for AIOT development and product application easily.

It can be configured with a far-field microphone array board, including 6 digital microphones, 12 three-color LEDs, 5 keys. It supports keyword wakeup, echo cancellation and noise reduction, VAD (Voice Activation Detection) and sound source location etc., which can significantly improve the accuracy and precision of automatic speech recognition.

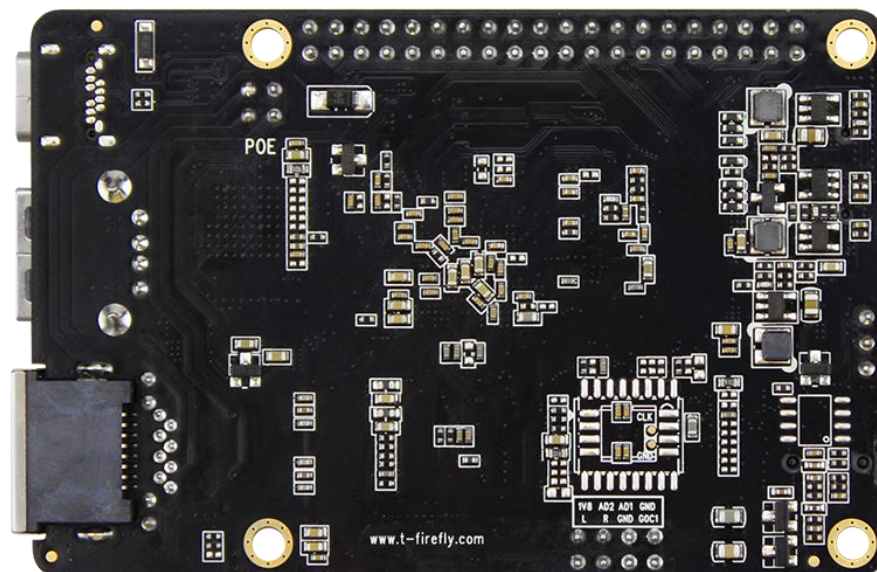
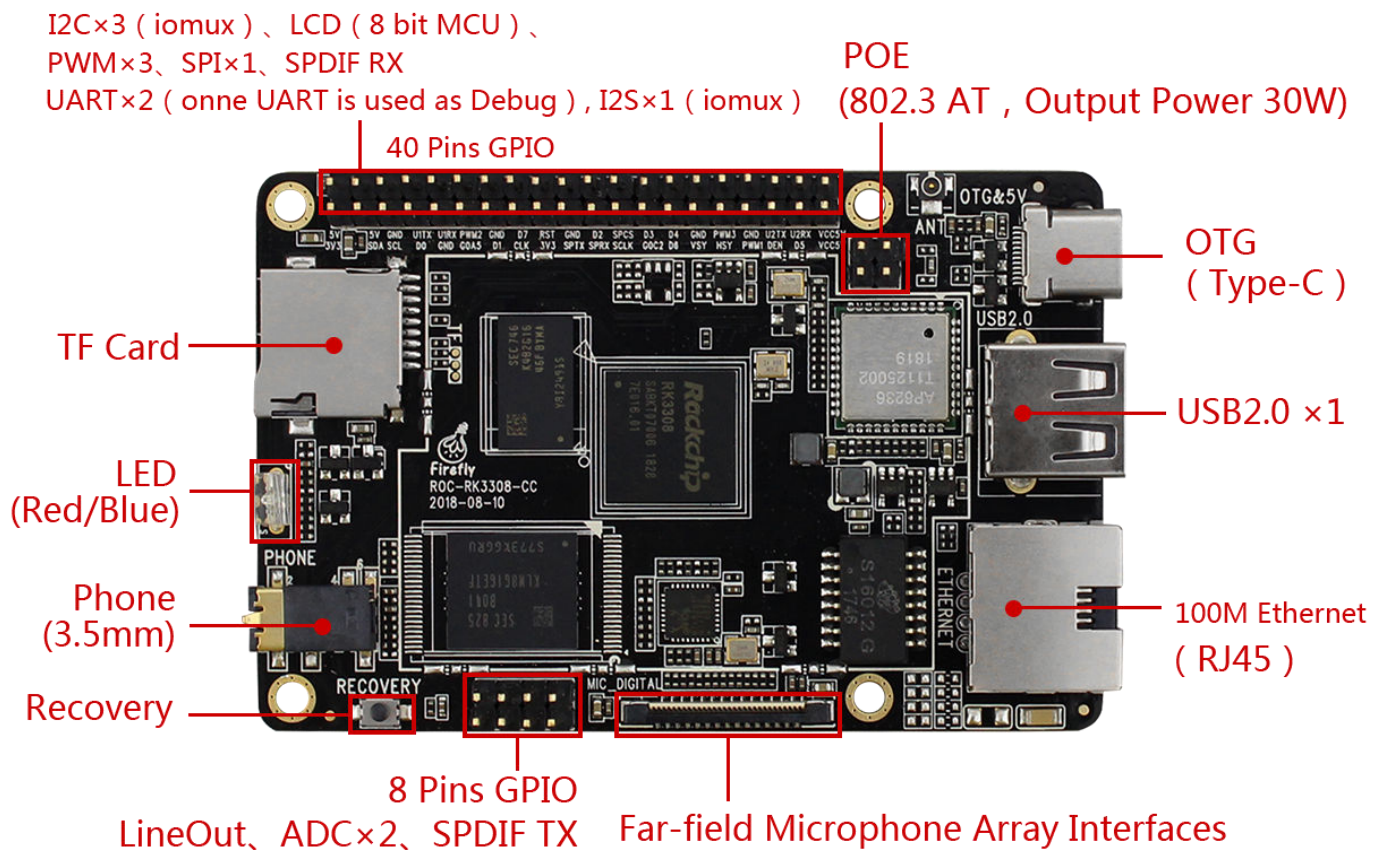


The main board can support MCU Display Screen with the maximum resolution of 480P, which can make display simpler and more convenient.

Equipped with 40Pin expansion interfaces, including I2C x 3, LCD, PWM x 3, SPI x 1, I2S x 1, SPDIF RX, UART x 2 (one UART is used as Debug) and other interfaces, and can support POE expansion.

Open SDK, tutorials, technical materials and development tools to make development easier and more convenient.

2. Interface description





3. Hardware Specifications

Specification	
Soc	RK3308 (28nm process)
CPU	Quad-core Cortex-A35, frequency up to 1.3GHz
RAM	Support 128MB-512MB DDR3
Storage	NandFlash: Support 128MB, 256MB eMMC: Support 4GB-128GB SPI Flash: 16MB ~512 MB Support MicroSD (TF) Card Slot expansion

Hardware Features	
Ethernet	100M Ethernet (RJ45 interface)
WiFi/ Bluetooth	Support 802.11 b/g/n protocol, support Bluetooth 4.2
Display	Support 8-bit MCU Display Screen, of which the resolution is up to 480P
Audio	With built-in audio CODEC, including ADC×8 and DAC×2
USB	USB 2.0 × 1、OTG × 1 (Type-C)
Debugging	Debug UART×1, be used for development and debugging
Key	Recovery × 1
Interfaces	POE (IEEE802.3AT standard) I2C×3 (iomux), UART×2 (one is for Debug), SPI×1, PWM×3 I2S×1 (iomux), LCD (8-bit MCU) ADC×2, LINEOUT, SPDIF IN/OUT
Microphone Array	Module pattern: Circular Number of array element: 6 Module size: Diameter of 86mm Wakeup distance: > 20m Identification distance: > 5m Signal-to-noise ratio: SNR > 63dB Operating temperature: -20°C - 80°C Sound source location: Horizontal 360° Location accuracy: ±12° Support keyword wakeup, sound source location, noise suppression and VAD

OS / Software

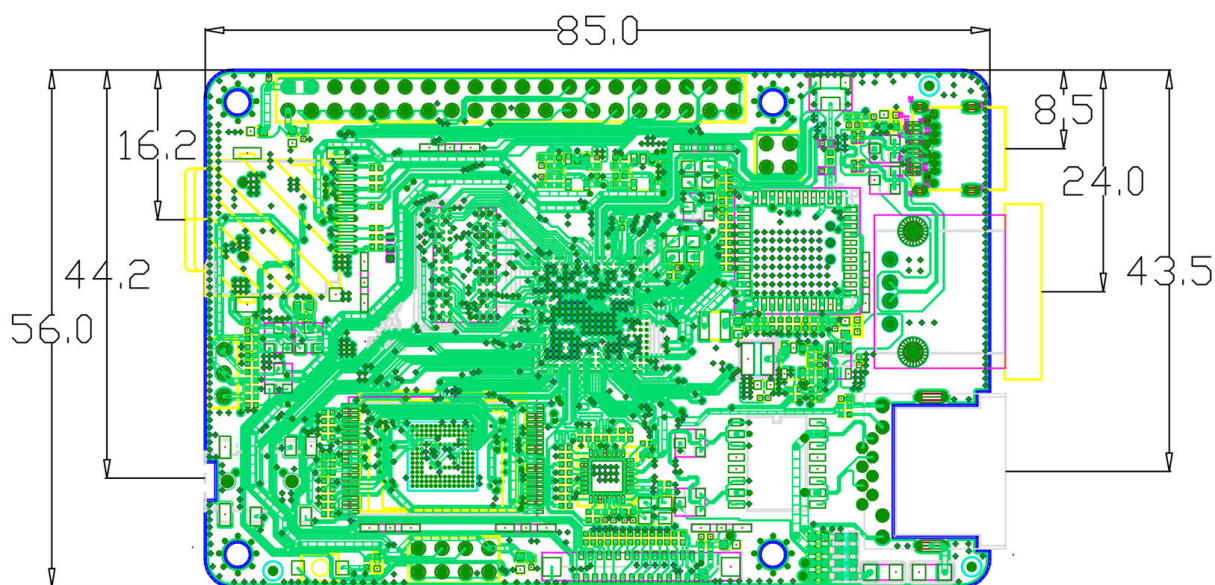
System/ Service	Support Buildroot, Support the conversational artificial intelligence operating system: DuerOS, Amazon AVS (Alexa Voice Service), Ali embedded operating system of IOT: AliOS Things, Open source robot operating system: ROS (Robot Operating System)
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Dimensions

Size	85 mm × 56 (mm)
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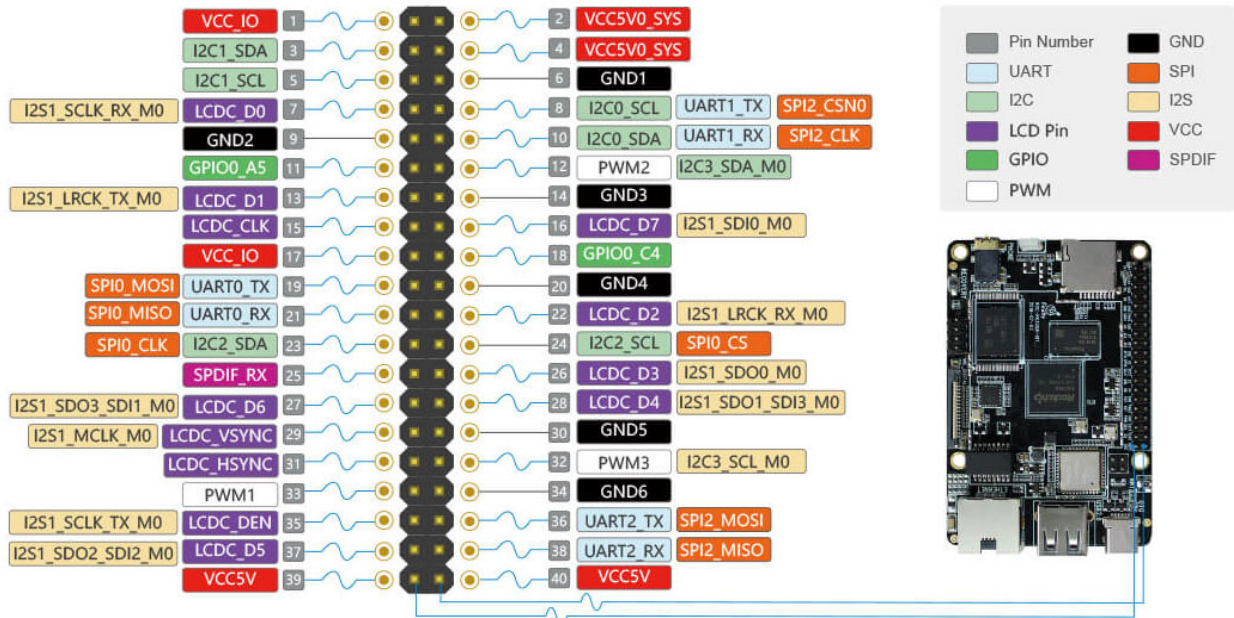
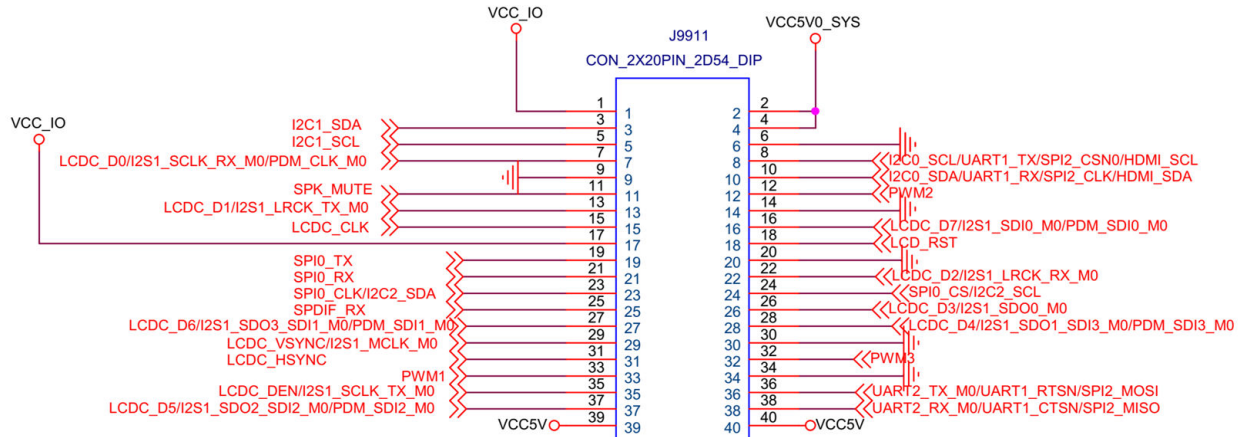
4. PCB Size

unit: mm



5. Interface definition

1、J9911





Num	Definition	Attribute	Description
1	VCC_IO	Power Output	Output3.3V
2	VCC5V0_SYS	Power Input	Input5V
3	GPIO0_B3/I2C1_SDA	Signal output	I2C1_SDASignal/GPIO Input/ Output
4	VCC5V0_SYS	Power Input	Input5V
5	GPIO0_B4/I2C1_SCL	Signal output	I2C1_SCLSignal/GPIO Input/ Output
6	GND1	GND	GND
7	GPIO1_A4/LCDC_D0/I2S1_SCLK_RX_M0/PDM_CLK_M0	Signal output	LCDC_D0Signal/GPIO Input/ Output
8	I2C0_SCL	Signal output	I2C0_SCLSignal/GPIO Input/ Output
9	GND2	GND	GND
10	GPIO1_D1/UART1_TX/I2C0_SCL/SPI2_CSN0	Signal output	I2C0_SDASignal/GPIO Input/ Output
11	GPIO0_A5	Input/出	GPIO Input/ Output
12	GPIO0_B7/PWM2/I2C3_SDA_M0	Input/出	PWM/GPIO Input/ Output
13	GPIO1_A5/LCDC_D1/I2S1_LRCK_TX_M0	Signal output	LCDC_D1Signal/GPIO Input/ Output
14	GND3	GND	GND
15	GPIO1_A0/LCDC_DCLK	Signal output	LCDC_CLK Signal/GPIO Input/ Output
16	GPIO1_B3/LCDC_D7/I2S1_SDI0_M0/PDM_SDI0_M0	Signal output	LCDC_D7Signal/GPIO Input/ Output
17	VCC_IO	Power Output	Output3.3V
18	GPIO0_C4	Signal output	LCDC_RST Signal/GPIO Input/ Output
19	GPIO2_A1/UART0_TX/SPI0_MOSI	Signal output	SPI0_TX/GPIO Input/ Output
20	GND4	GND	GND
21	GPIO2_A0/UART0_RX/SPI0_MISO	Signal output	SPI0_RXSignal/GPIO Input/ Output
22	GPIO1_A6/LCDC_D2/I2S1_LRCK_RX_M0	Signal output	LCDC_D2Signal/GPIO Input/ Output
23	GPIO2_A2/UART0_CTSN/SPI0_CLK/I2C2_SDA	Signal output	SPI0_CLK/I2C2_SDA/GPIO Input/ Output
24	GPIO2_A3/UART0_RTSN/SPI0_CSN0/I2C2_SCL	Signal output	SPI0_CS/I2C2_SCL/GPIO Input/ Output
25	GPIO0_C2/SPDIF_RX	Signal output	SPI0_RXSignal/GPIO Input/ Output



26	GPIO1_A7/LCDC_D3/I2S1_SDO0_M0	Signal output	LCDC_D3Signal/GPIO Input/ Output
27	GPIO1_B2/LCDC_D6/I2S1_SDO3_SDI1_M0/PDM_SDI1_M0	Signal output	LCDC_D6Signal/GPIO Input/ Output
28	GPIO1_B0/LCDC_D4/I2S1_SDO1_SDI3_M0/PDM_SDI3_M0	Signal output	LCDC_D4Signal/GPIO Input/ Output
29	GPIO1_A2/LCDC_VSYNC/I2S1_MCLK_M0	Signal output	LCDC_VSYNC Signal/GPIO Input/ Output
30	GND5	GND	GND
31	GPIO1_A1/LCDC_HSYNC	Signal output	LCDC_HSYNC Signal/GPIO Input/ Output
32	GPIO0_C0/PWM3/I2C3_SCL_M0	Signal output	PWM/GPIO Input/ Output
33	GPIO0_B6/PWM1	Signal output	PWM/GPIO Input/ Output
34	GND6	GND	GND
35	GPIO1_A3/LCDC_DEN/I2S1_SCLK_TX_M0	Signal output	LCDC_DEN Signal/GPIO Input/ Output
36	GPIO1_C7/UART1_RTSN/UART2_TX_M0/SPI2_MOSI/JTAG_TMS	Signal output	UART2_TX/GPIO Input/ Output
37	GPIO1_B1/LCDC_D5/I2S1_SDO2_SDI2_M0/PDM_SDI2_M0	Signal output	LCDC_D5Signal/GPIO Input/ Output
38	GPIO1_C6/UART1_CTSN/UART2_RX_M0/SPI2_MISO/JTAG_TCK	Signal Input	UART2_RX/GPIO Input/ Output
39	VCC5V	Power Output	Output5V
40	VCC5V	Power Output	Output5V

2、J9910

Num	Definition	Attribute	Description
1	VCC_1V8	Power Output	Output1.8V
2	CODEC_LINEOUT_L	AudioOutput	Audio left channel Output
3	ADC_IN2	ADC Input	ADC
4	CODEC_LINEOUT_R	Audio Output	Audio Right channel Output
5	ADC_IN0	ADC Input	ADC
6	GND1	GND	GND
7	GND2	GND	GND
8	GPIO0_C1/SPDIF_TX	Signal output	SPDIF_TX Signal/GPIO Input/ Output

6. Appendix

1 .Source code acquisition

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

2 .Contact us



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