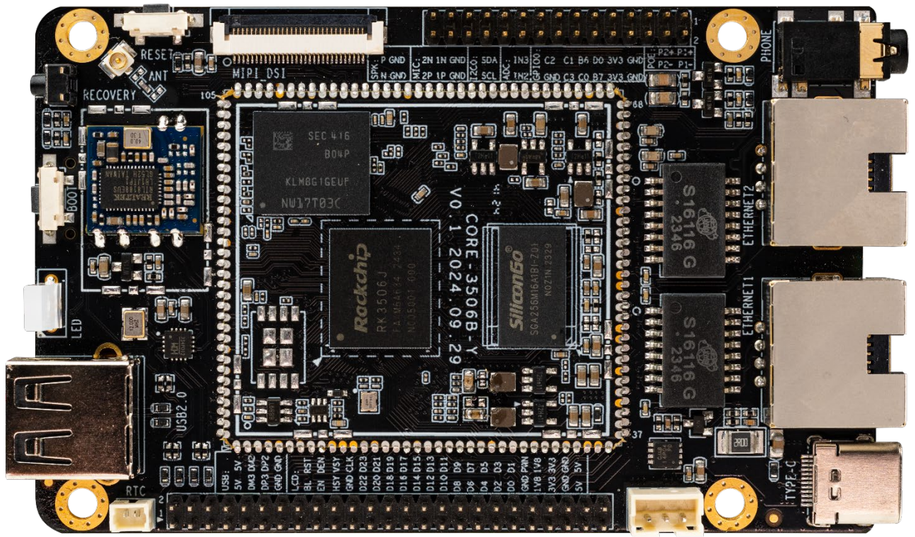
Quad-core Mainboard

- ROC-RK3506B-CC(Commercial)
- ROC-RK3506J-CC(Industrial)



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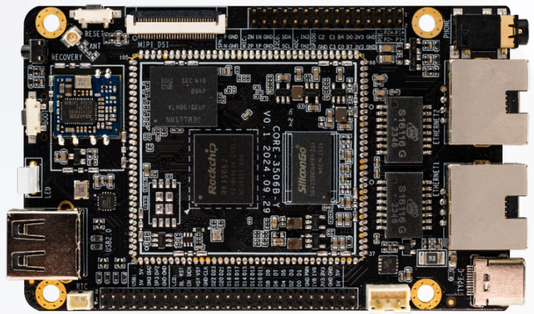
Product features



The new industrial chip RK3506

It adopts Rockchip's new industrial chip RK3506 series, 22nm advanced process technology, integrated triple-core ARM Cortex-A7 + single-core Cortex-M0, the main frequency is up to 1.6GHz.

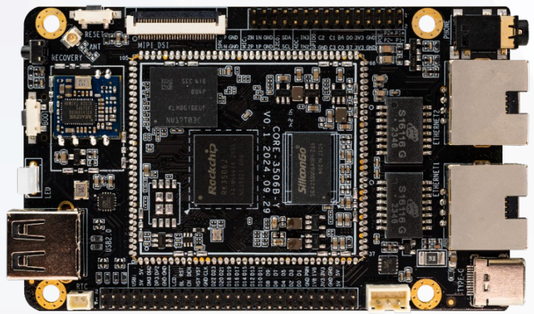
Low latency and high real-time performance

It supports AMP multi-core heterogeneous architecture, and one chip can support Linux, RTOS, and Bare-metal flexible combinations, such as 2×Cortex-A7 Linux + 1×Cortex-A7 RTOS + Cortex-M0 HAL or 3×Cortex-A7 RTOS + Cortex-M0 HAL and other combinations, using the standard RPMsg inter-core communication mechanism.

Lightweight UI framework adaptation

The RK3506 SDK natively supports the LVGL lightweight UI framework, and combined with the on-chip 2D hardware acceleration to make LVGL run more smoothly. From hardware power-on, bootloading, kernel loading, and finally to UI display, the whole link is optimized for startup.

Product features



Supports multiple operating systems

The SDK supports Linux Kernel 6.1, provides support based on Buildroot system, and supports AMP multi-core heterogeneous systems, and implements the RTOS SMP mode for the first time on the multi-core architecture of the Rockchip platform, and adds multi-core scheduling support in the real-time system.

Abundant expansion interfaces

Equipped with USB2.0, MIPI DSI, LCD, SPK, MIC, I2C, ADC, GPIO, POE and other expansion interfaces to meet the peripheral expansion needs of different scenarios.

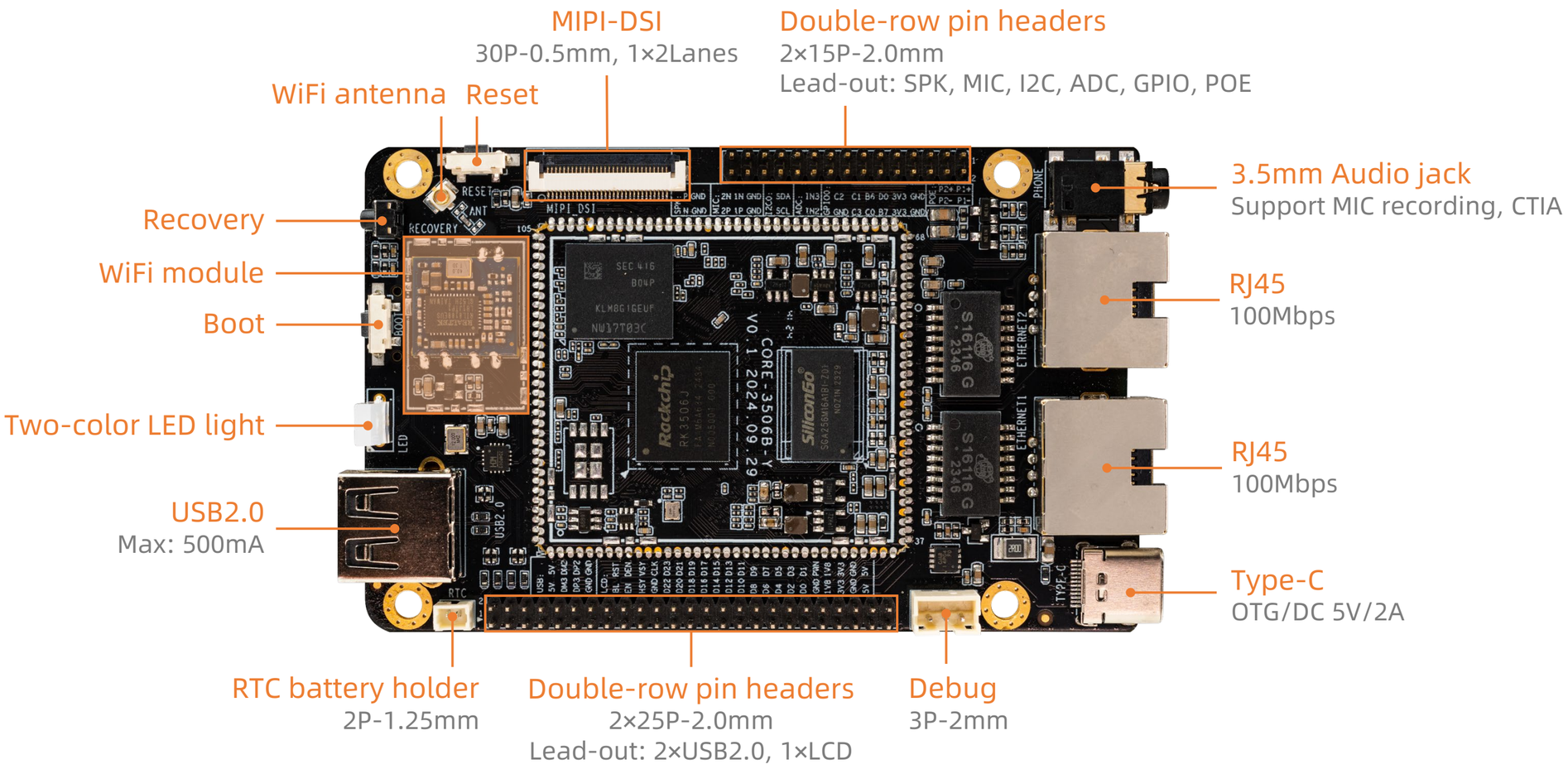
A wide range of applications

It is widely used in: industrial HMI, PLC, industrial gateway, industrial control, smart home, home appliance display control, handheld POS machine and other industries.

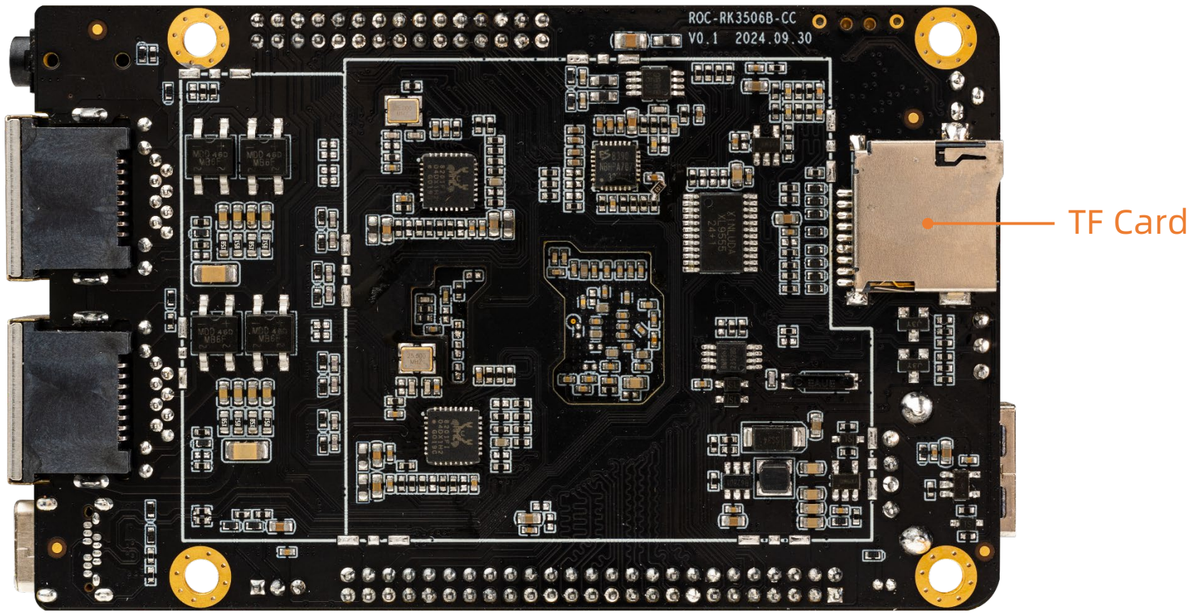
Specifications

		ROC-RK3506B-CC (Commercial)	ROC-RK3506J-CC (Industrial)
Basic Specifications	SOC	Rockchip RK3506B	Rockchip RK3506J
	CPU	Quad-core 32-bit processor (3×Cortex-A7+1×Cortex-M0), 22nm advanced process technology, main frequency up to 1.6GHz	Quad-core 32-bit processor (3×Cortex-A7+1×Cortex-M0), 22nm advanced process technology, normal mode main frequency up to 1.2GHz, overdrive mode main frequency up to 1.5GHz
	Image processing	Built-in 2D diagramming engine	
	Video decoding	Video Soft Solution: 720P@30fps, 480P@60fps H.264/MJPEG, support RTSP video streaming	
	RAM	512MB DDR3 (256MB/512MB optional)	
	Storage	8GB eMMC, 256MB SPI Flash (optional), 1 × TF Card (Not pasted by default, it cannot be used at the same time as eMMC, but can be used at the same time as SPI Flash)	
	OS	Linux	
	Power	DC 5V/2A (Powered by Type-C, voltage tolerance ± 5%)	
	Power consumption	Max: 1.5W(5V/300mA) Normal: 1W(5V/200mA) Min(Sleep): Not supporting sleep mode	Max: 1.5W(5V/300mA) Normal: 1W(5V/200mA) Min(Sleep): 0.2W(5V/40mA)
	Size	99.43mm × 60.0mm × 12.39mm	
	Weight	≈42g	
	Environment	Operating Temperature: -20℃ ~ 60℃ Storage Humidity: 10% ~ 90%RH (non-condensing)	Operating Temperature: -40℃ ~ 85℃ Storage Humidity: 10% ~ 90%RH (non-condensing)
Interface Specifications	Internet	2 × 100M Ethernet (RJ45/100Mbps), supports 2.4GHz single-band WiFi (802.11a/b/g/n)	
	Video output	1 × MIPI-DSI (1×2 Lanes, 1280×1280@60fps, 30Pin-0.5mm) Supports RGB/MIPI display screens with 2 Lanes (up to 720P resolution)	
	Audio	1 × 3.5mm Audio jack (Support MIC recording, American Standard CTIA)	
	USB	1 × USB2.0 (HOST, Max: 500mA), 1 × Type-C (OTG/DC 5V)	
	Button	1 × Reset, 1 × Recovery, 1 × Boot	
	Other interfaces	1 × Debug (3Pin-2mm), 1 × RTC battery holder (2Pin-1.25mm), 1 × WiFi antenna, 1 × DSMC (Multiplexed with LCD), 1 × Flexbus (Multiplexed with LCD) 1 × Double-row pin headers (2×25Pin-2mm): 2 × USB2.0, 1 × LCD 1 × Double-row pin headers (2×15Pin-2mm): SPK, MIC, I2C, ADC, GPIO, POE	

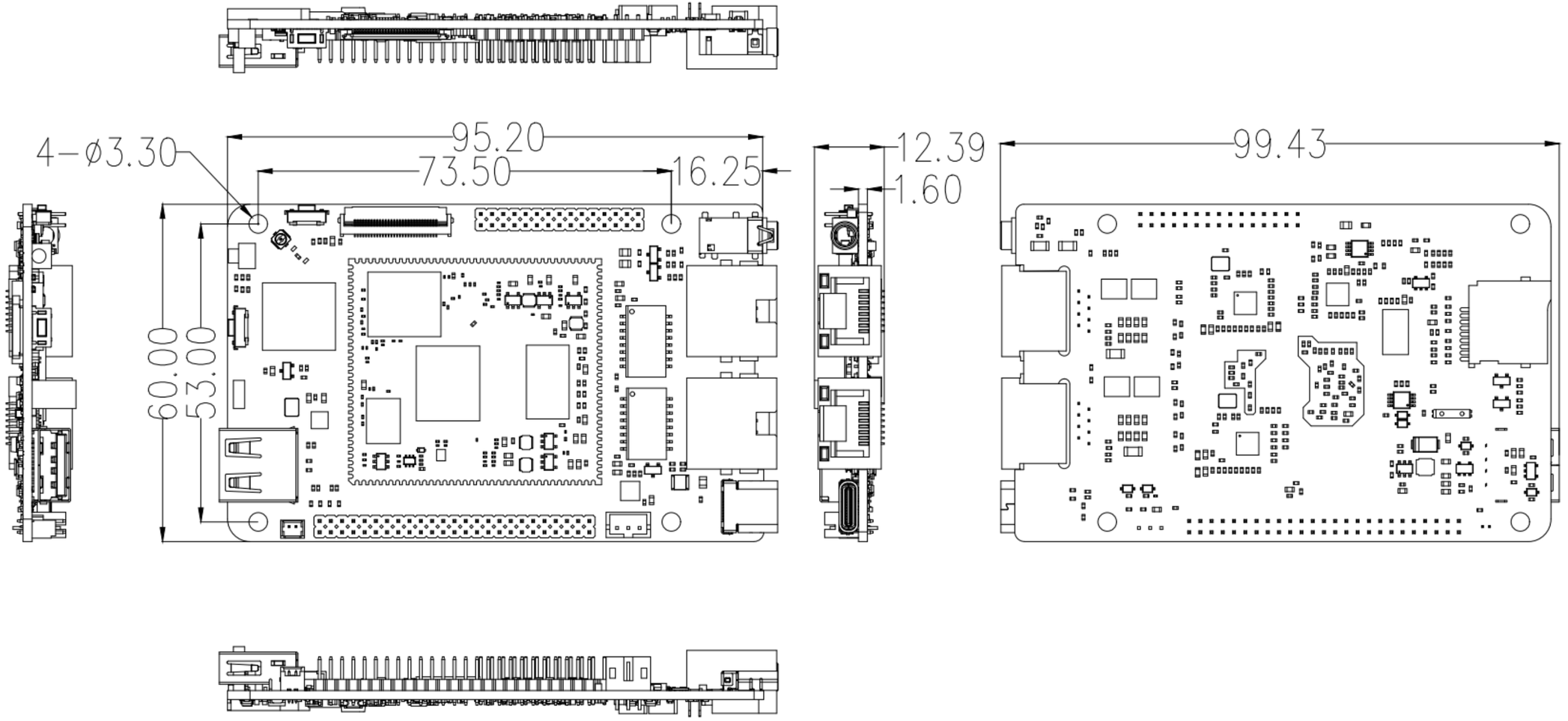
Interface description



Interface description

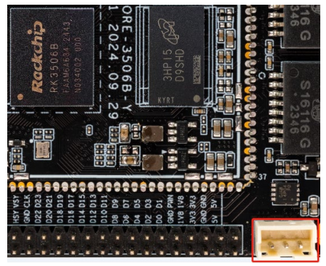


Dimension



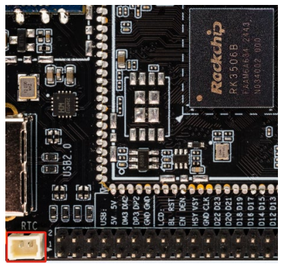
Interface definition

1. (J2) DEBUG: 3 PIN 2.0mm Pitch wafer Seat



NO.	Definition	Power/V	NO.	Definition	Power/V
1	UART0_RX	3.3	3	GND	
2	UART0_TX	3.3			

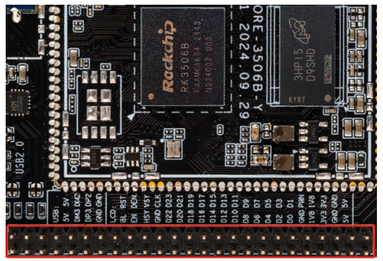
2. (J2605) RTC_BAT 1.25mm Pitch wafer Seat



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	BAT+	3.3

Interface definition

3. (J5) Double-row pin headers LCDC INTERFACE 2*25PIN 2.0mm Pitch



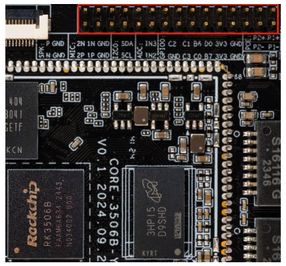
NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC5V0_HOST1(5.0V OUTPUT)	5.0V (MAX:500mA)	2	VCC5V0_HOST1(5.0V OUTPUT)	5.0V (MAX:500mA)
3	HOST_DM3	-	4	HOST_DM2	-
5	HOST_DP3	-	6	HOST_DP2	-
7	GND		8	GND	
9	LCD_BL 【Expand IO】	3.3	10	LCD_RST【Expand IO】	3.3
11	LCD_EN 【Expand IO】	3.3	12	LCD_DEN (GPIO1_A0_d)	3.3
13	LCDC_HSYNC (GPIO1_A2_d)	3.3	14	LCD_VSYNC (GPIO1_A1_d)	3.3
15	GND		16	LCDC_CLK (GPIO1_A3_d)	3.3
17	LCD_D22 (GPIO1_A5)	3.3	18	LCD_D23 (GPIO1_A4)	3.3
19	LCD_D20 (GPIO1_A7)	3.3	20	LCD_D21 (GPIO1_A6)	3.3
21	LCD_D18 (GPIO1_B1)	3.3	22	LCD_D19 (GPIO1_B0)	3.3
23	LCD_D16 (GPIO1_B3)	3.3	24	LCD_D17 (GPIO1_B2)	3.3
25	LCD_D14 (GPIO1_B5)	3.3	26	LCD_D15 (GPIO1_B4)	3.3
27	LCD_D12 (GPIO1_B7)	3.3	28	LCD_D13 (GPIO1_B6)	3.3

Interface definition

29	LCD_D10 (GPIO1_C1)	3.3	30	LCD_D11 (GPIO1_C0)	3.3
31	LCD_D8 (GPIO1_C3)	3.3	32	LCD_D9 (GPIO1_C2)	3.3
33	LCD_D6 (GPIO1_C5)	3.3	34	LCD_D7 (GPIO1_C4)	3.3
35	LCD_D4 (GPIO1_C7)	3.3	36	LCD_D5 (GPIO1_C6)	3.3
37	LCD_D2 (GPIO1_D1)	3.3	38	LCD_D3 (GPIO1_D0)	3.3
39	LCD_D0 (GPIO1_D3)	3.3	40	LCD_D1 (GPIO1_D2)	3.3
41	GND		42	LCD_PWM (GPIO0_A6_d)	3.3
43	VCC_1V8 (1.8V Output)	1.8	44	VCC_1V8 (1.8V Output)	1.8
45	VCC_3V3 (3.3V Output)	3.3	46	VCC_3V3 (3.3V Output)	3.3
47	GND		48	GND	
49	VCC5V0_SYS(5.0V Output)	5.0V (MAX:500mA)	50	VCC5V0_SYS (5.0V Output)	5.0V (MAX:500mA)

Interface definition

4. (J6) Double-row pin headers EXTENSION INTERFACE 2*15PIN 2.0mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	P1+(POE1 OUTPUT)	+44~57V	2	P1-(POE1 GND)	
3	P2+(POE2 OUTPUT)	+44~57V	4	P2-(POE2 GND)	
5	GND		6	GND	
7	VCC_3V3 (3.3V Output)	3.3	8	VCC_3V3 (3.3V Output)	3.3
9	EXT_GPIO【Expand IO】	3.3	10	GPIO0_B7_d	3.3
11	GPIO0_B6_d （TP_INT） Pull-up resistor 10K	3.3	12	GPIO0_C0_d	3.3
13	GPIO0_C1_d	3.3	14	GPIO0_C3_d	3.3
15	GPIO0_C2_d	3.3	16	GND	
17	SARADC_IN3【GPIO4_B3_z】	1.8	18	SARADC_IN2【GPIO4_B2_z】	3.3
19	I2C0_SDA 【GPIO0_A5_d】 Pull-up resistor 2.2K	3.3	20	I2C0_SCL 【GPIO0_A4_d】 Pull-up resistor 2.2K	3.3
21	GND		22	GND	
23	MICIN_1N (To ES8390) series capacitor 1uF	3.3	24	MICIN_1P (To ES8390) series capacitor 1uF	3.3
25	MICIN_2N (To ES8390) series capacitor 1uF	3.3	26	MICIN_2P (To ES8390) series capacitor 1uF	3.3

27	GND		28	GND	
29	Speaker+_OUT (3W@4Ω,1.7W@8Ω)	5.0	30	Speaker-_OUT (3W@4Ω, 1.7W@8Ω)	5.0

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