Shenzhen Geniatech Co.,Ltd.

RK3506 Development Board Specification

Model: DB3506

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Revision History

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V1.0	2026/1/28	RKN251106_V1_0	13		

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目　录

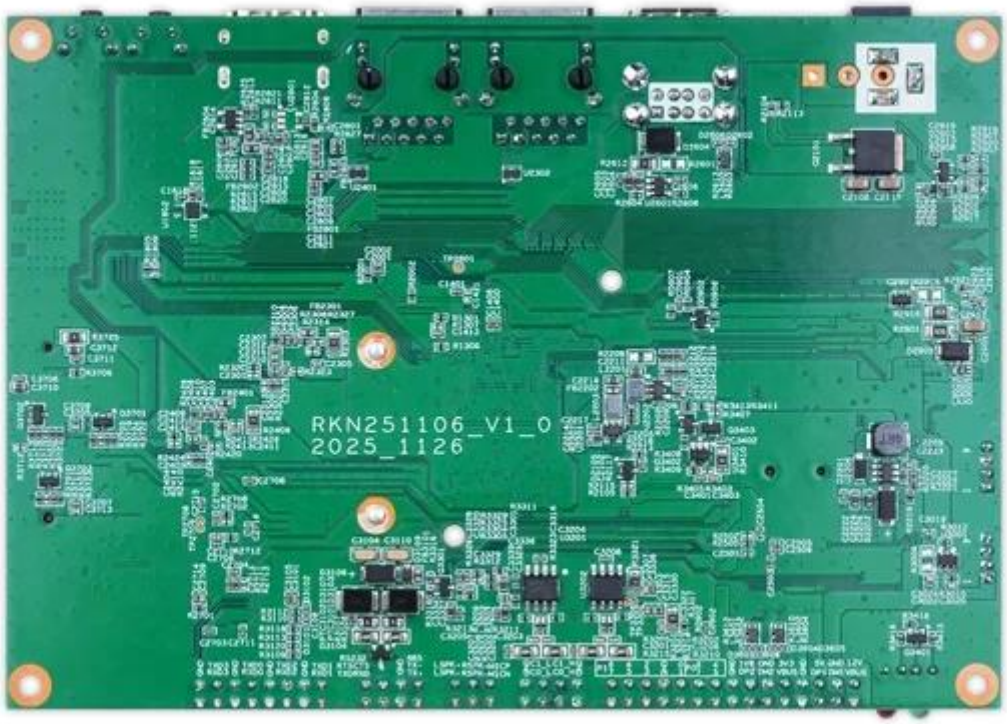
1.Product Introduction

DB3506 is a development board based on the RK3506 chip, serving as a highly integrated core board/development platform designed for industrial control and Human-Machine Interface (HMI) applications. Leveraging its unique heterogeneous computing architecture, professional graphics display engine, and a rich set of industrial interfaces, it aims to provide a stable, efficient, and cost-effective solution for embedded applications that require smooth graphical interfaces, real-time control, and connectivity to multiple peripherals. This product features extensive industrial-grade interfaces and flexible expansion capabilities, primarily targeting application areas such as industrial HMI, industrial PLCs, power DTUs, residential energy storage EMS/BMS, IoT gateways, environmental monitoring systems, and smart retail terminals.

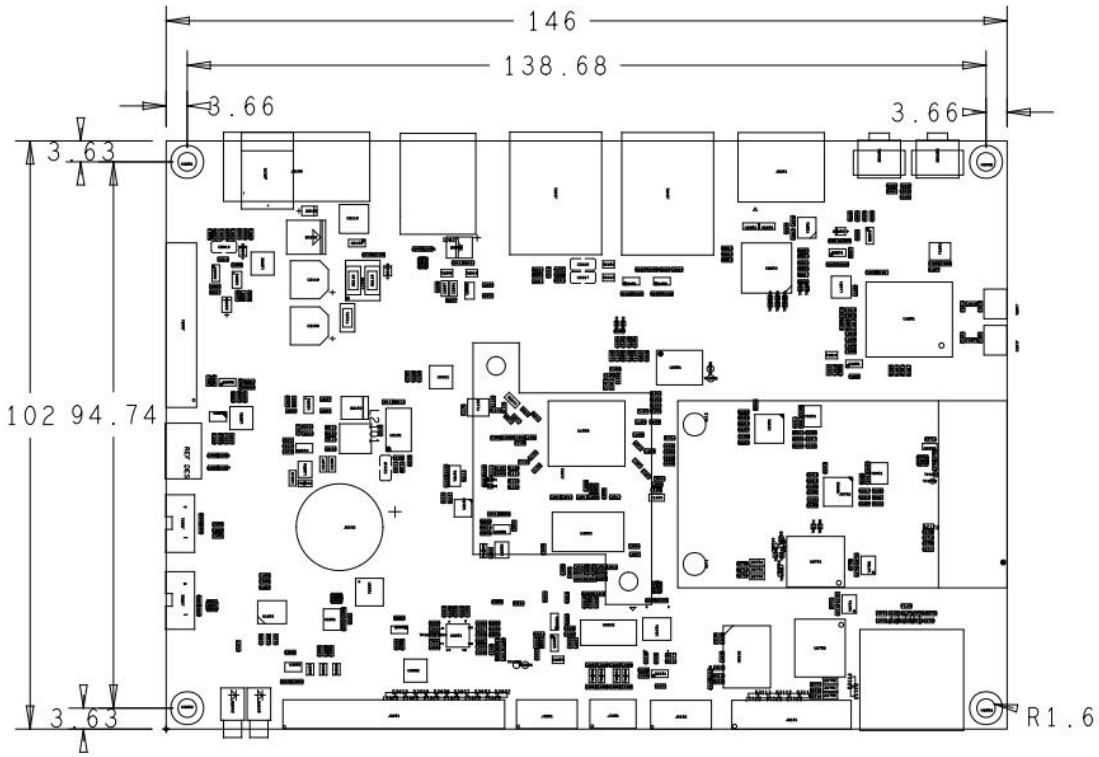
- Tri-core ARM Cortex-A7 + ARM Cortex-M0 multi-core heterogeneous architecture, balancing high performance and high real-time capability.
- Supports up to 1280x1280@60fps output, integrated with a dedicated 2D hardware acceleration engine.
- Equipped with audio-video multimedia interfaces such as HDMI OUT, RGB OUT, Audio OUT/MIC IN, etc.
- Includes communication interfaces such as 2x Fast Ethernet, 2x USB 2.0, 2x CAN, RS485, RS232, etc.
- Onboard WiFi/BT module, with optional 4G module support.
- Built-in watchdog and RTC battery, capable of supporting 7*24 hours stable operation.
- Multiple storage configuration options: 256MB/512MB/1GB RAM selectable, 256MB/512MB NAND Flash selectable.

2.Product Images

The image below is for reference only,please prevails in kind



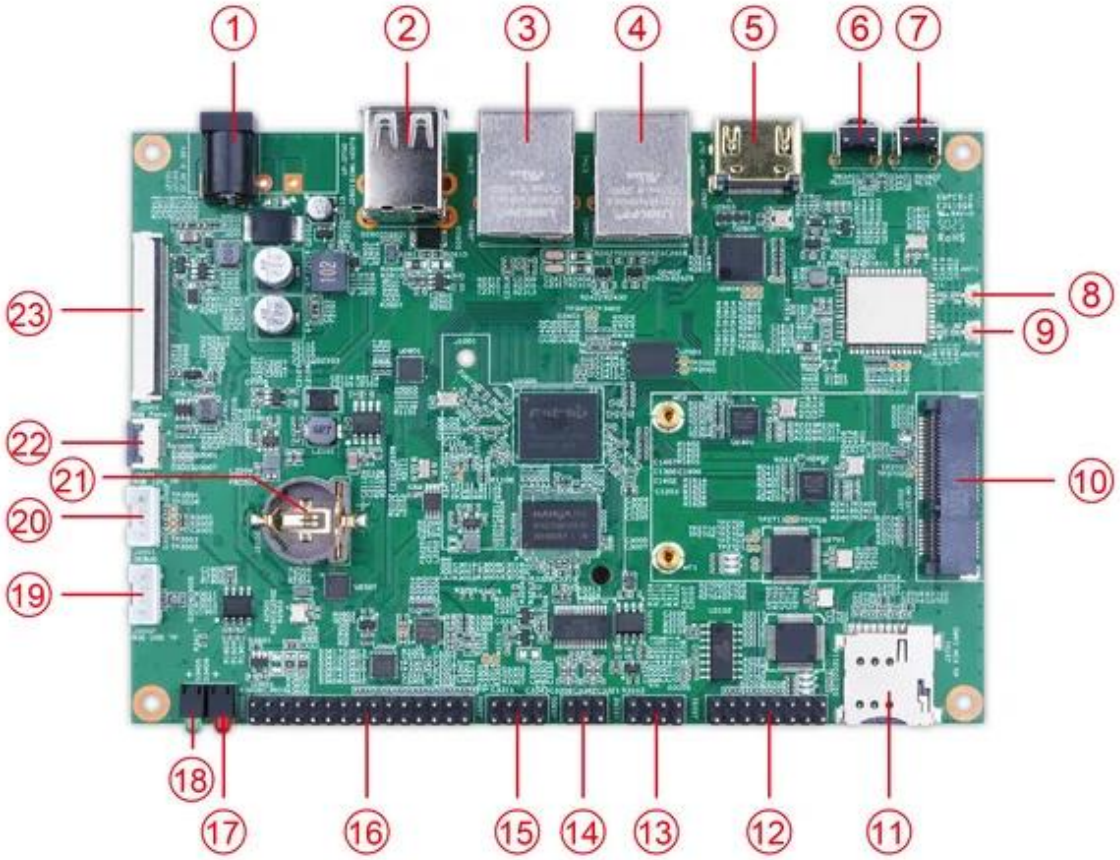
Product Dimension Drawing



3.Product Features

Chip model	RK3506	
MARKET AREA	Global	
Configuration	**OS**	Yocto/buildroot(Linux)
	SOC	Tri-core ARM Cortex-A7 + ARM Cortex-M0
	GPU	2D Graphic Engine – embedded with high-performance 2D acceleration hardware.
	LPDDR3	512MB (with optional configurations of 256MB or 1GB)
	NAND Flash	256MB (256MB / 512MB selectable)
	Wi-Fi/BT	Wifi2.4G+5G +BT5.0
Development board Interfaces	**External I/O Connector**	1 x Recover Key
		1 x Reboot Key
		1 x DC Jack
		2 x USB 2.0 Type-A
		2 x Fast Ethernet
		1 x Micro SIM Socket
		1 x HDMI OUT
	Internal I/O Connector	2 x WiFi/BT Antenna Interface
		1 x Mini PCIe for 4G
		4 x UART
		1 x RS232&RS485
		1 x Audio
		2 x CAN
		1 x Expended Connector
		2 x LED Indicators (Red: Power; Green: System Status)
		1 x RGB Touch USB Interface
		1 x Debug 1x4P Header
		1 x RTC-Battery
		1 x RGB Touch Screen I2C Interface
		1 x RGB Display Interface
	DC-IN	DC 12V/1.5A
Development board size	Dimensions：146mm×102mm；Weight：105g	
Operating Environment	**Industrial Grade:**Operating Temperature: -40℃ to 85℃;Humidity: 5% to 95% RH, non-condensing **Commercial Grade:**Operating Temperature: 0℃ to 60℃;Humidity: 20% to 80% RH, non-condensing	
Storage Environment	**Industrial Grade:**Operating Temperature: -40℃ to 105℃;Humidity: 5% to 95% RH, non- condensing **Commercial Grade:**Operating Temperature: -20℃ to 70℃;Humidity: 10% to 90% RH, non- condensing	

4.Interface Functional Description

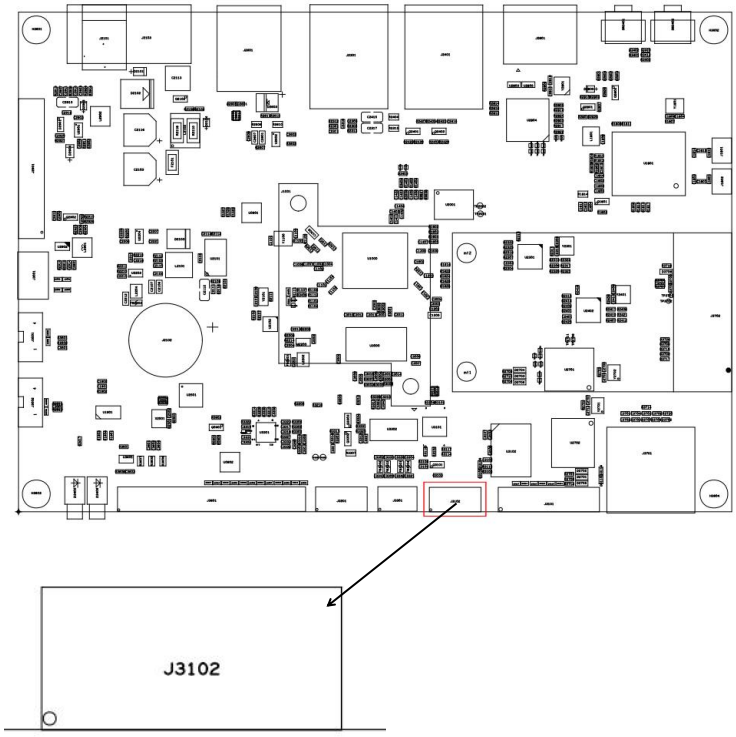


No.	Label	Function	Note
1	J2101/(J2103)	DC Jack connector	Power Socket: 5.5×2.1mm / (Optional 2- Pin Lockable Phoenix Terminal)
2	J2601	2 x USB 2.0 Type-A	
3	J2301	Fast Ethernet	
4	J2401	Fast Ethernet	
5	J2801	HDMI OUT	
6	SW3401	Recover Key	Entering System Upgrade Mode
7	SW3402	Reboot Key	System Reboot Function
8	J1801	WiFi/BT Antenna Interface	IPEX
9	J1802		
10	J3702	Mini PCIe for 4G	
11	J3701	Micro SIM Socket	
12	J3101	4 x UART	2 x 8P Header , pitch 2.54mm
13	J3102	RS232&RS485	2 x 4P Header , pitch 2.54mm

No.	Label	Function	Note
14	J3301	Audio	2 x 3P Header , pitch 2.54mm
15	J3201	2 x CAN	2 x 4P Header , pitch 2.54mm
16	J3601	Expended Connector	2 x 15P Header , pitch 2.54mm
17	D3406	LED	Red LED: Power Indicator
18	D3405	LED	Green LED: System Status Indicator
19	J3002	RGB Touch USB Interface	1 x 4P Header , pitch 2.0mm
20	J3501	Debug	1 x 4P Header , pitch 2.0mm
21	J2102	RTC-Battery	
22	J3001	RGB Touch Screen I2C Interface	8P FPC ,pitch 0.5mm
23	J2901	RGB Display Interface	50P FPC,pitch 0.5mm

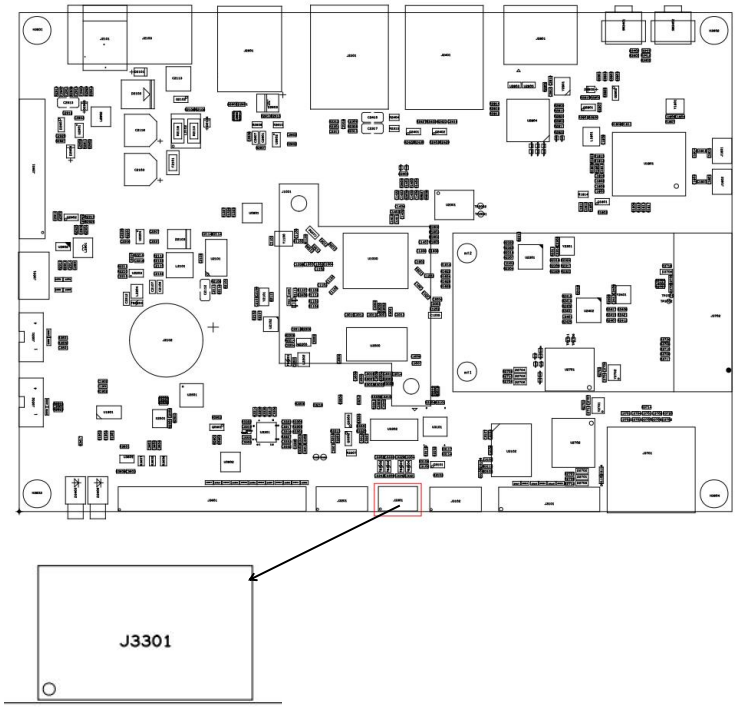
5.Interface Pin Description

5.1 J3102：RS232&RS485



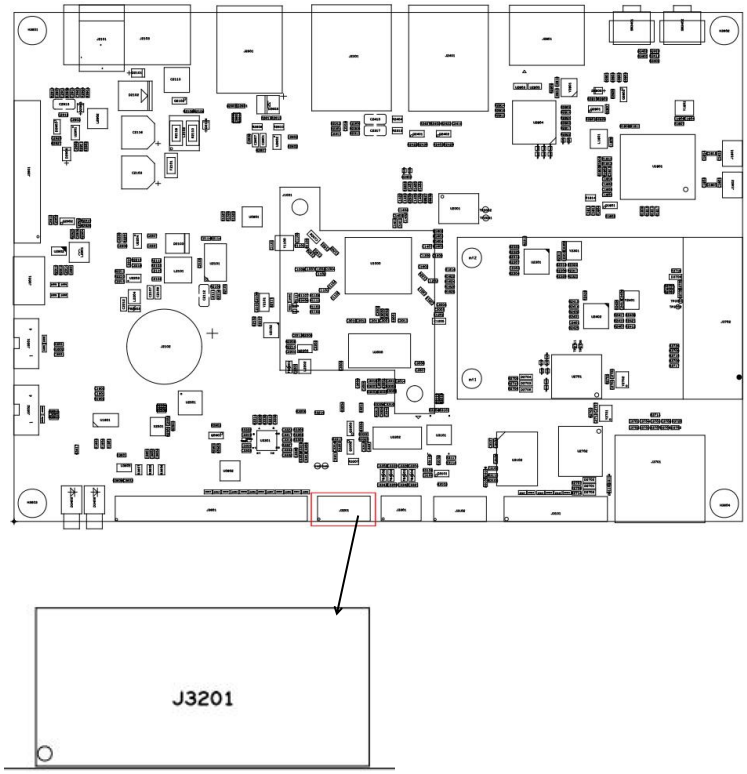
J3102(2 x 4P Header)	
Pin	Function
1	RS485_TX+
2	RS485_TX-
3	GND
4	GND
5	RS232_RXD
6	RS232_CTS
7	RS232_TXD
8	RS232_RTS

5.2 J3301：Audio



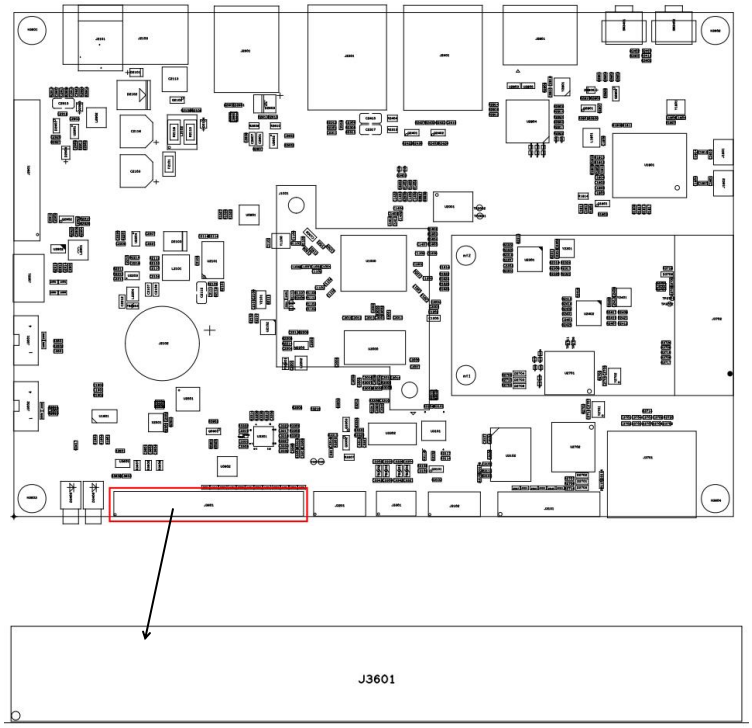
J3301(2 x 3P Headerr)	
Pin	Function
1	MIC2N
2	MIC2P
3	RSPK-
4	RSPK+
5	LSPK-
6	LSPK+

5.3 J3201：CAN



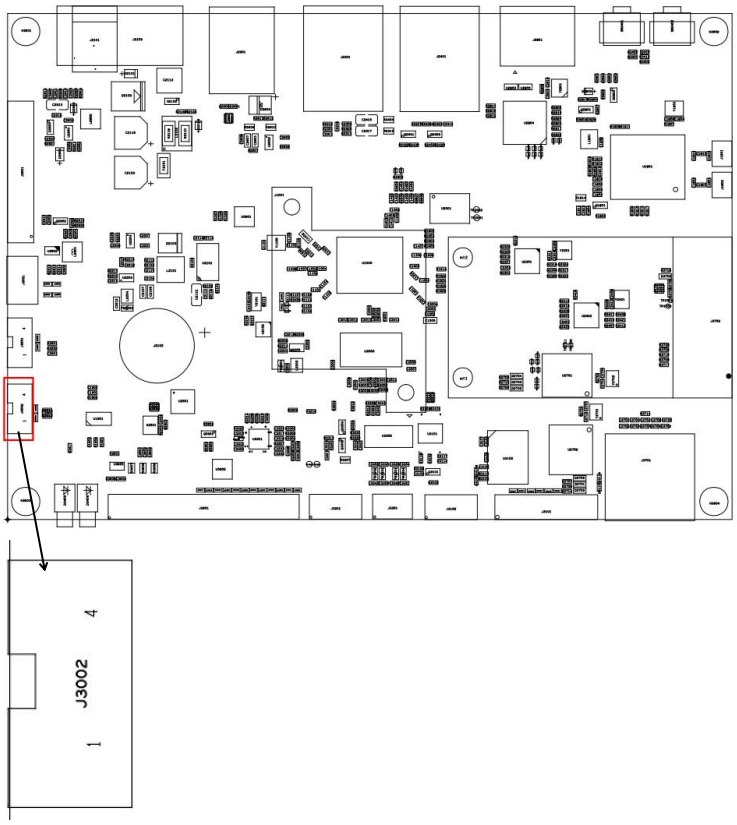
J3201(2 x 4P Header)	
Pin	Function
1	GND
2	GND
3	CAN0_H
4	CAN1_H
5	CAN0_L
6	CAN1_L
7	GND
8	GND

5.4 J3601：Expended Connector



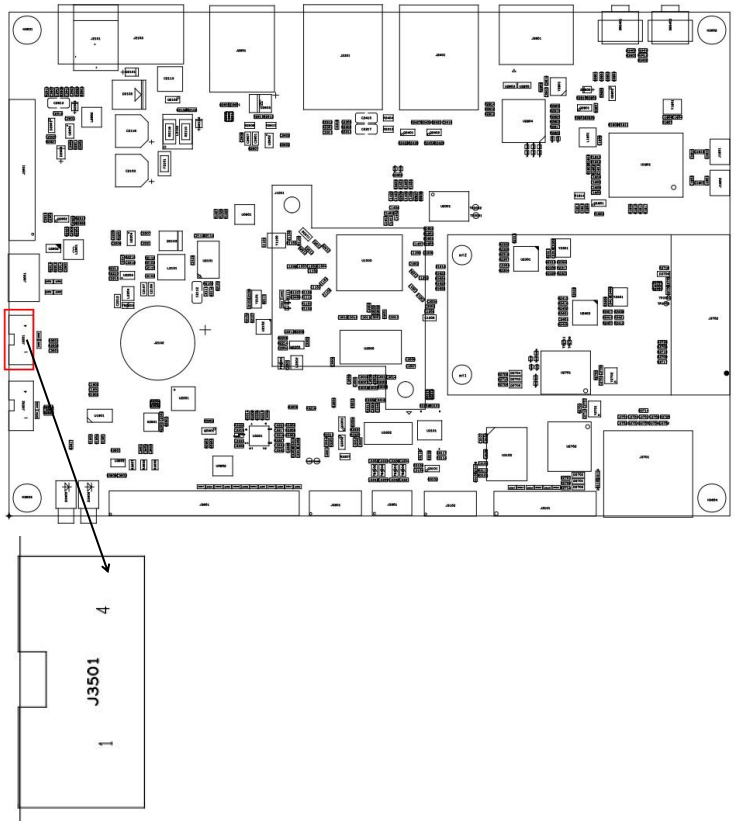
J3601(2 x 15P Header)			
Pin	Function	Pin	Function
1	VCC5V0_USB_HOST1	2	VDD_12V
3	USB_HUB_DM1_CON	4	GND
5	USB_HUB_DP1_CON	6	VCC5V0_SYS
7	GND	8	GND
9	VCC5V0_USB_HOST2	10	VCC_3V3
11	USB_HUB_DM2_CON	12	GND
13	USB_HUB_DP2_CON	14	VCC_1V8
15	GND	16	GND
17	TCA9555_P0_5	18	TCA9555_P0_4
19	TCA9555_P0_7	20	TCA9555_P0_6
21	TCA9555_P1_1	22	TCA9555_P1_0
23	GND	24	GND
25	TCA9555_P1_3	26	TCA9555_P1_2
27	TCA9555_P1_5	28	TCA9555_P1_4
29	TCA9555_P1_7	30	TCA9555_P1_6

5.5 J3002：RGB Touch USB Interface



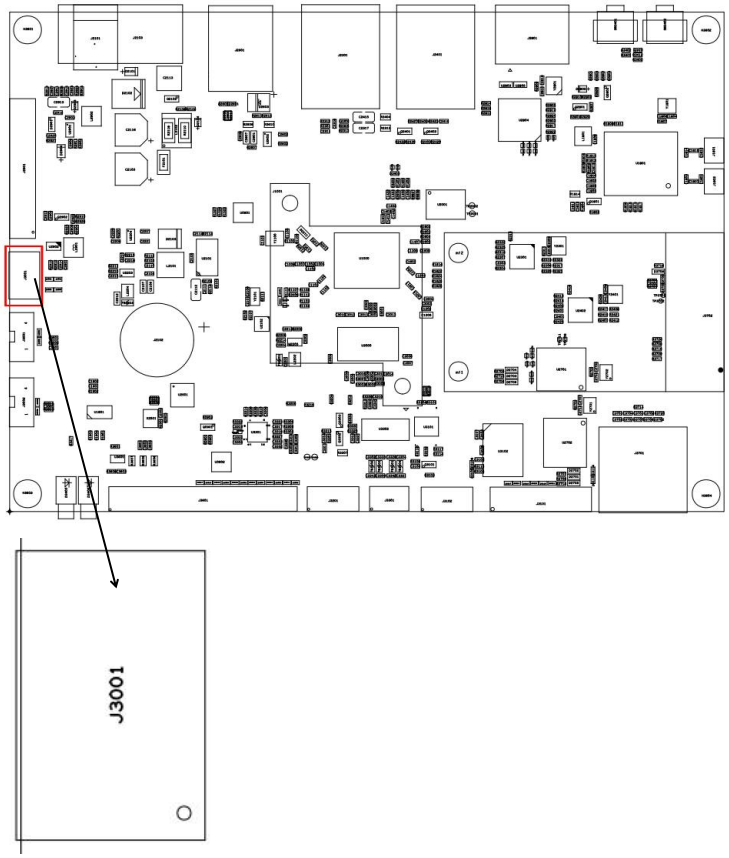
J3002(1 x 4P Headerr)	
Pin	Function
1	VCC5V0_USB3_HOST7
2	USB_HUB_DM7_CON
3	USB_HUB_DP7_CON
4	GND

5.6 J3501：Debug



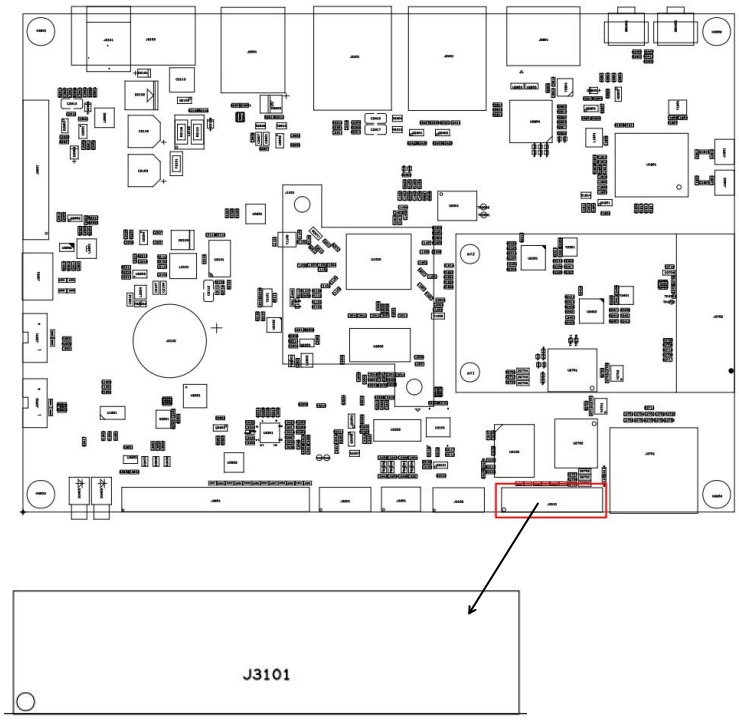
J3501(1 x 4P Headerr)	
Pin	Function
1	VCC_3V3
2	UART_TX_DEBUG
3	GND
4	UART_RX_DEBUG

5.7 J3001：RGB Touch Screen I2C Interface



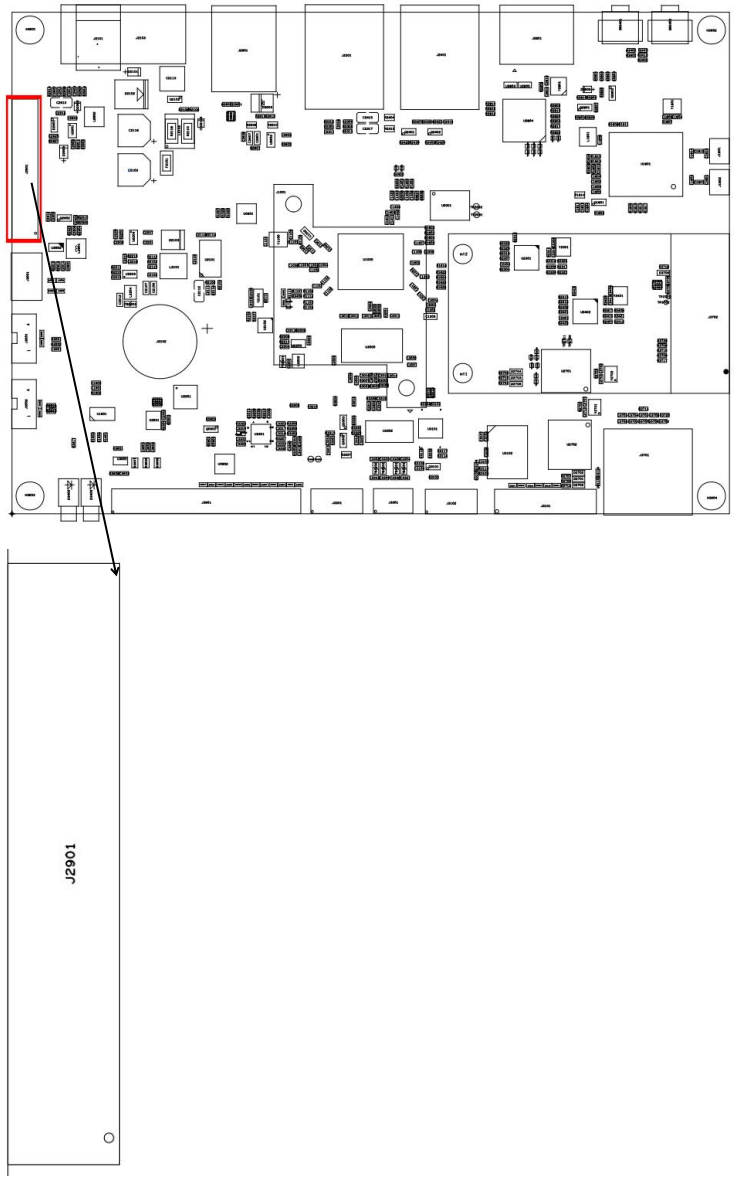
J3001(8P FPC)	
Pin	Function
1	GND
2	TP_I2C_SCL
3	TP_I2C_SDA
4	TP_nINT
5	TP_nRST
6	NC
7	VCC_3V3
8	NC

5.8 J3101：UART



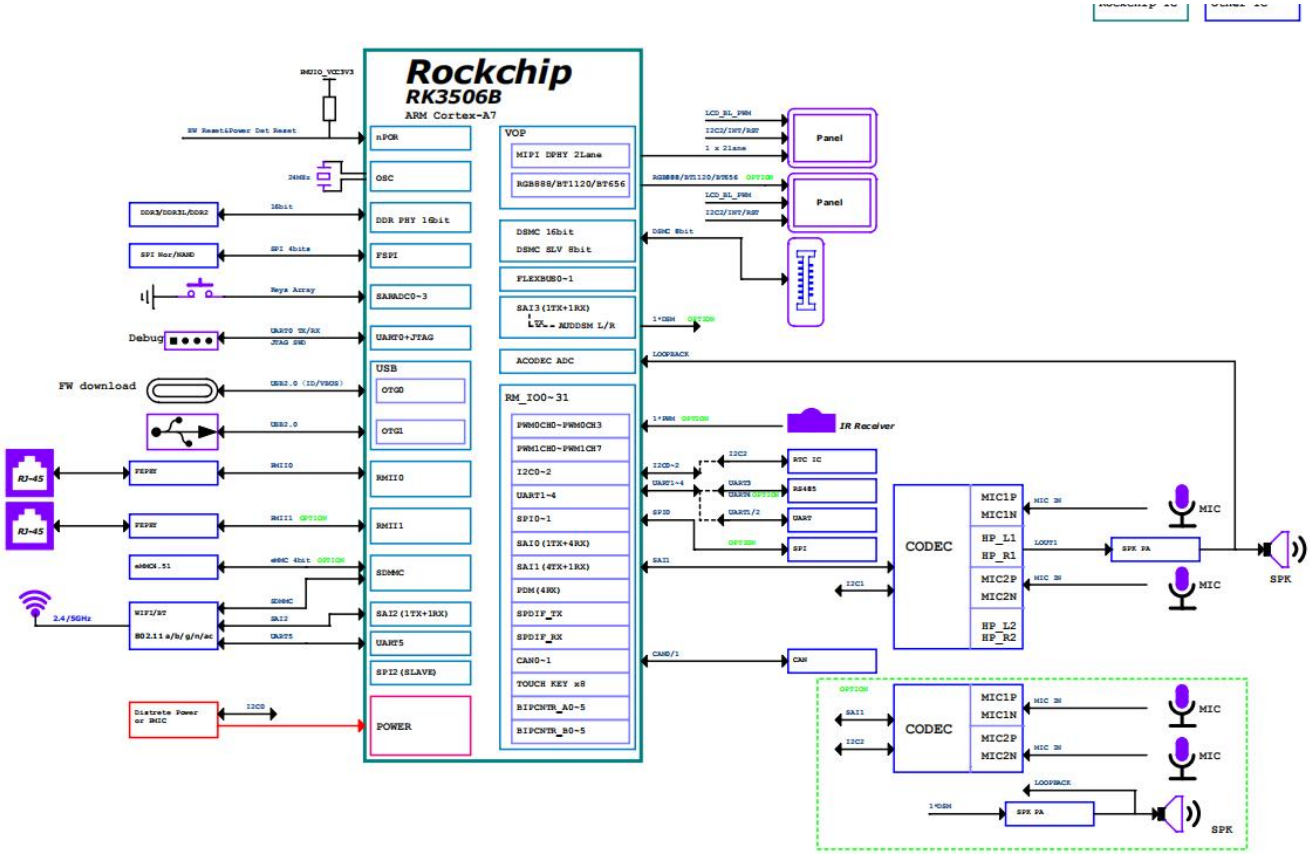
J3101(2 x 8P Header)			
Pin	Function	Pin	Function
1	UARTB_RXD1	2	UARTB_TXD1
3	GND	4	GND
5	UARTB_RXD2	6	UARTB_TXD2
7	GND	8	GND
9	UARTB_RXD0	10	UARTB_TXD0
11	GND	12	GND
13	UARTB_RXD3	14	UARTB_TXD3
15	GND	16	GND

5.9 J2901：RGB Display Interface



J2901(50P FPC)			
Pin	Function	Pin	Function
1	VCC_LED_A	26	VO_LCDC_D9
2	VCC_LED_A	27	VO_LCDC_D8
3	VCC_LED_K	28	VO_LCDC_D23
4	VCC_LED_K	29	VO_LCDC_D22
5	GND	30	VO_LCDC_D21
6	VCOM_LCD	31	VO_LCDC_D20
7	VCC3V3_LCD	32	VO_LCDC_D19
8	LCD_MODE	33	VO_LCDC_D18
9	VO_LCDC_DEN	34	VO_LCDC_D17
10	VO_LCDC_VSYNC	35	VO_LCDC_D16
11	VO_LCDC_HSYNC	36	GND
12	VO_LCDC_D7	37	VO_LCDC_CLK
13	VO_LCDC_D6	38	GND
14	VO_LCDC_D5	39	SHLR
15	VO_LCDC_D4	40	UPDN
16	VO_LCDC_D3	41	VGH
17	VO_LCDC_D2	42	VGL
18	VO_LCDC_D1	43	AVDD_LCD
19	VO_LCDC_D0	44	LCD_RST_CON
20	VO_LCDC_D15	45	NC
21	VO_LCDC_D14	46	VCOM_LCD
22	VO_LCDC_D13	47	DITH
23	VO_LCDC_D12	48	GND
24	VO_LCDC_D11	49	NC
25	VO_LCDC_D10	50	NC

6.Hardware Block Diagram



7.Important Usage Notes

- Do not squeeze, bend, or disassemble the circuit board.
- Keep the circuit board away from static electricity.
- Do not allow water or other liquids to contact the circuit board.
- Clean the board with a soft, dry cloth or a brush.
- Do not use long connecting cables, as this may affect performance and image quality.
- The display output and RGB output are mutually exclusive and cannot be used simultaneously. Only one can be active at a time.