



STAMP-RK3506-Kit

Hardware Manual

Version: V1.0

March 2025

QIYANG TECHNOLOGY Co., Ltd
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Company Profile

Zhejiang Qiyang Intelligent Technology Co., Ltd. was founded in Hangzhou in 2007, is a national high-tech enterprise focusing on the development, production and sales of ARM embedded products. More than 10 years of accumulation and precipitation, successfully built a product development to mass production service chain.

As the core of the company, Qiyang R&D team consists of more than 30 embedded engineers, dedicated to providing users with easy-to-use embedded hardware, software tools and customized product solutions. It has been widely used in industrial control, Internet of Things, new retail, medical, electric power, environmental monitoring, charging pile and other fields.

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Technical Support Phone: +86-0571-87858811-805

Official website: [www.qiytech.com\(Chinese\)](http://www.qiytech.com(Chinese))
[/www.qiyangtech.com\(English\)](http://www.qiyangtech.com(English))

Information updates

1. Information updates

Product-related manuals and datasheets are constantly being improved and updated; please ensure that they are up-to-date when you use them.

2. Update notice

Qiyang's newest product information and news updates will be released through the WeChat official account, please pay attention!



3. How to get information

After purchase, please contact the relevant sales staff to obtain the SDK.

4. Provided materials

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Software: factory image, related kernel source code, interface test source code, cross compiler

Hardware: corresponding baseboard schematic, PCB source file (Allegro16.6)

Files: hardware manual, test manual, user manual, environment construction manual, IO pin comparison table, core board, baseboard structure dimension drawing (dxf), chip information.

Usage suggestions:

- 1) before using the development board, be sure to read the hardware manual first;
- 2) please check the packing list carefully before use and check whether there are any missing files;
- 3) understand the basic structure and composition of the development kit, including the allocation of hardware resources, the definition of each pin of the core board and the carrier board, and the definition of the expansion pins, etc.;
- 4) if you need to burn an image, test the development kit functions, you also need to read the user manual and test manual;
- 5) we accept bulk orders for the STAMP-RK3506-Kit development kit.

Version Record

Version No.	Hardware Platform	Date	Description	Revised by
V1.0	STAMP-RK3506-MB- BETA-V1_00 STAMP-RK3506-CM- BETA-V1_00	2025-03	Initial version	Maoh

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NOTE: The manual mainly introduces the hardware interface of the STAMP-RK3506-Kit development kit

I. System Composition

1.1. Chip Overview

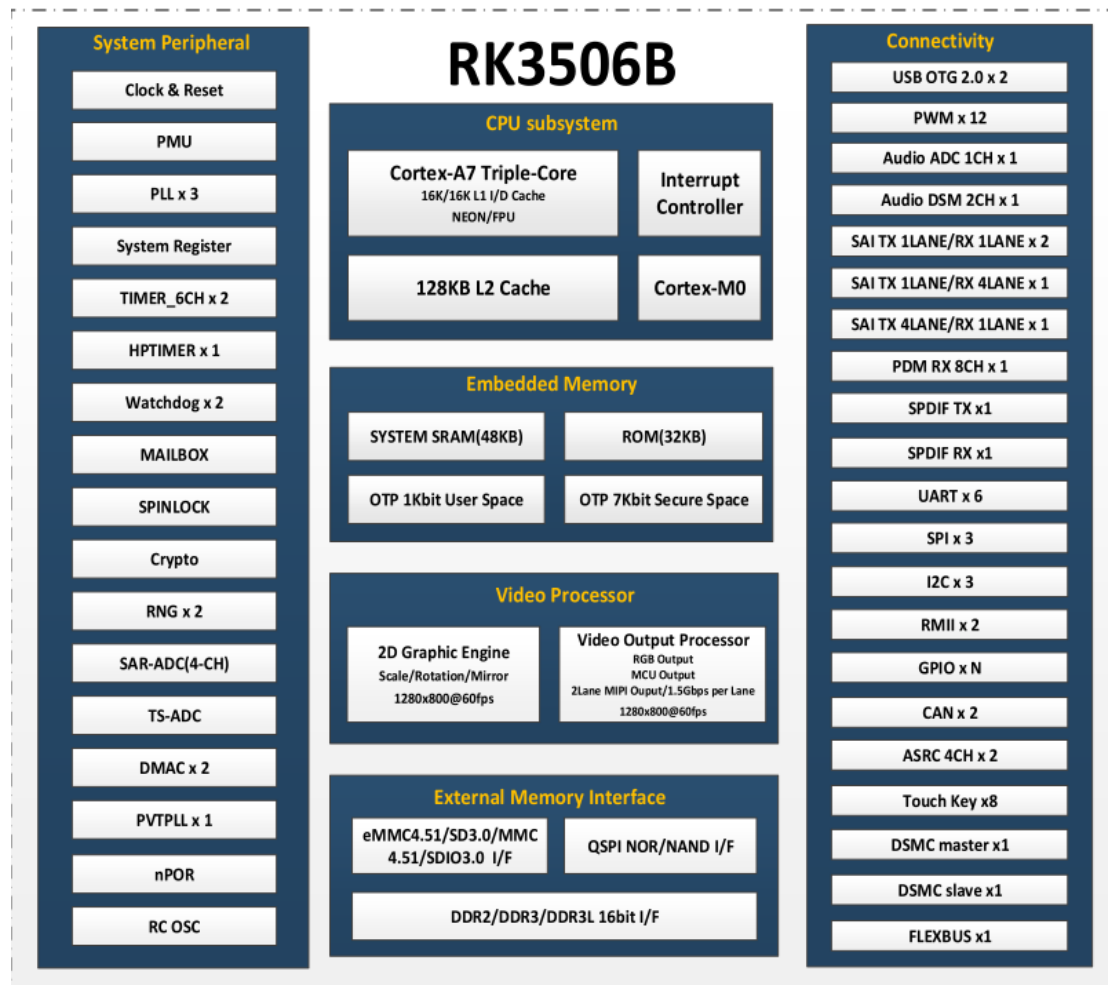
RK3506B is a high-performance triple-core Cortex-A7 application processor designed for smart voice interaction, audio input/output processing, image output processing and other digital multimedia applications.

Embedded 2D hardware engine and display output engine minimize CPU overhead in order to meet image display requirements.

Embedded rich peripheral interfaces, such as SAI, PDM, SPDIF, Audio SDM, Audio ADC, USB2 OTG, RMII, CAN can meet different application development needs and reduce the hardware development complexity and cost.

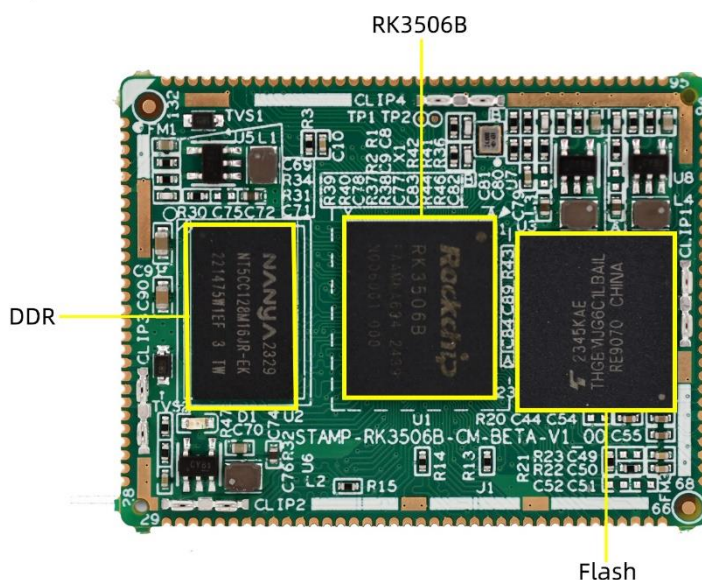
RK3506B has a high-performance external memory interface (DDR2/DDR3/DDR3L) capable of sustaining demanding memory bandwidth.

RK3506B Processor Block Diagram:



1.2. SOM Module Overview

The STAMP-RK3506B-CM core board is a 6-layer PCB board with high-precision gold-immersion process and high TG (glass transition temperature), with reliable electrical performance and anti-interference performance; the SOM has integrated CPU, DDR3L, eMMC, etc.; the stamp holes on the module lead to up to 132 pins for the fullest expansion of the RK3506B hardware resources. Different interface functions can be reused and combined according to the pin situation to make a carrier board that meets the client's needs.



- ◆ Onboard RockChip RK3506B processor;
- ◆ Onboard 256MB DDR3L, 8GB eMMC (standard option);
- ◆ The SOM adopts 6-layer PCB high precision immersion gold process;
- ◆ SOM size: 44mm x 34mm, it suits for various application scenarios;
- ◆ The SOM has stamp holes to lead out the core board resources, with a spacing of 1mm;
- ◆ Power: 5V;

- ◆ Supports Linux6.1, Buildroot.

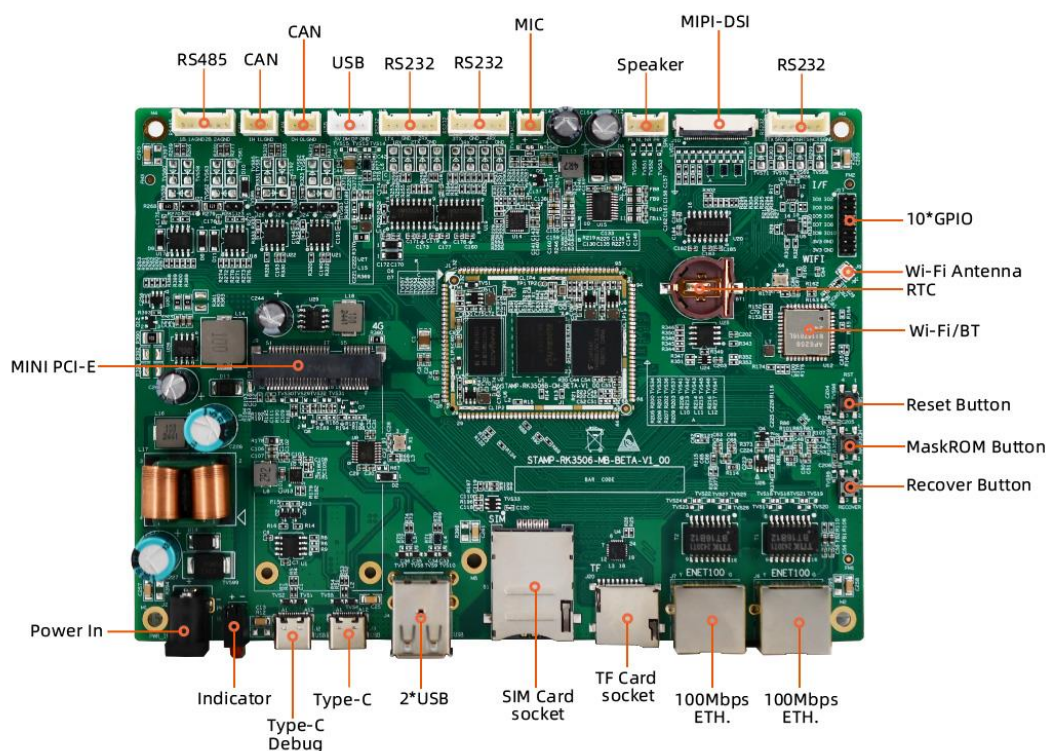
1.3. Development Board Resources

Hardware Resources	CPU	RockChip RK3506B
	Processor	Triple ARM® Cortex™-A7 core ARM® Cortex™-M0 RK3506 main frequency up to 1.5GHz
	RAM	256MB DDR3L
	Flash	8GB eMMC
	Ethernet	2-ch network chipset adopts MII mode to support 10M/100M Ethernet
	WLAN	Onboard AP6256 Wi-Fi module, supports 2.4GHz/5GHz 802.11 a/b/g/n protocols
	Connectivity	4-ch RS232 serial port (three-wire serial ports, two of which are multiplexed with RS485)
		1-ch RS232 serial port (Wi-Fi multiplexed five-wire serial port)
		2-ch RS485
		2-ch CANFD
	Display	1-ch 2-lane MIPI_DSI display interface, resolution up to 1280x1280@60
	Audio	Stereo amplifier output
		1-ch MIC audio input
	USB	3-ch USB2.0 HOST, 2-ch Type-A, 1 PHB2.0 port
		1-ch USB Type-c (Debug)
	Expansion	MINI-PCIE (USB2.0), external 4G module, SIM card interface
	Other Interfaces	GPIO * 10 (3.3V, 4 of which are shared with Wi-Fi)
	Storage	1-ch TF card slot
	Other Features	Reset circuit, watchdog circuit, real-time clock
	Power Input	9V - 30V, default DC_12V
Electricity	Layer/Size	SOM Size: 44mm x 34mm, 6-layer high precision immersion gold technology
		Carrier Board Size: 125mm x 172mm, 4-layer high precision immersion gold technology
	Power Consumption	The power consumption of the whole board is 5W (non-loaded)

	Operation Temperature	0°C - +70°C
	Storage Temperature	-10°C - +80°C
	Humidity	5% - 95%, non-condensation
	Options	Standard option: 256MB DDR3/8GB eMMC (0°C - +70°C) TODO

II. Development Board Interface Functions

➤ Interface Block Diagram



2.1. Basic Functions

Number	Functions
J21	DC12V power input
J19/J18	CAN
J11	MIC input
J12	Speaker output
J2	Debug serial port (USB TO SERIAL)
J13	RS232 (three-wire, multiplexed with RS485)
J15	RS232 (three-wire)
J16	RS232 (five-wire, multiplexed with WLAN)
J14	RS485
J10	MIPI-DSI (2-lane) Display Interface
BT1	RTC battery
SW3	Recoverybutton
SW2	Maskrom button
SW1	Reset button
J7/J6	100M Ethernet interface
J3	Type-C interface
J20	TF card slot
S1	SIM card slot
J5	USB2.0 PHB HOST
J4	Double-layer USB2.0 Type-A HOST
J17	GPIO (3.3V)
J9	MIMI-PCIE (USB2.0)

2.2. PIN Definition

Starting from the core board interface pin 1, go counterclockwise

Multiplexing GPIO	Signal Name	PIN#	PIN#	Signal Name	Multiplexing GPIO
GPIO0_B2_d	UART1_TXD	1	2	UART1_RXD	GPIO0_B1_d
GPIO0_B0_d	IO_RS485_DIR2	3	4	GND	
	CPU_nPOR	5	6	GND	
GPIO0_A7_d	UART2_TXD	7	8	UART2_RXD	GPIO0_A6_d
GPIO0_A5_d	UART3_TXD	9	10	UART3_RXD	GPIO0_A4_d
GPIO0_A3_d	UART4_TXD	11	12	UART4_RXD	GPIO0_A0_u
GPIO0_A2_u	IO_EXT_PWREN	13	14	IO_ENET1_nRST	GPIO0_A1_d
	VCC_SYS_5V0	15	16	VCC_SYS_5V0	
	VCC_SYS_5V0	17	18	VCC_SYS_5V0	
	GND	19	20	GND	
	GND	21	22	GND	
	VCC_SYS_1V8	23	24	VCC_SYS_1V8	
	VCC_SYS_3V3	25	26	VCC_SYS_3V3	
	GND	27	28	GND	
GPIO3_B5_d	ENET2_MDIO	29	30	ENET2_MDC	GPIO3_B4_d
	GND	31	32	ENET2_TXEN	GPIO3_B3_d
GPIO3_B2_d	ENET2_TXD1	33	34	ENET2_TXD0	GPIO3_B1_d
GPIO3_B0_d	ENET2_CLK	35	36	ENET2_RXDV	GPIO3_B6_d
GPIO3_A7_d	ENET2_RXD1	37	38	ENET2_RXD0	GPIO3_A6_d
	GND	39	40	ENET1_MDIO	GPIO2_B7_d
GPIO2_B6_d	ENET1_MDC	41	42	GND	

GPIO2_B5_d	ENET1_TXEN	43	44	ENET1_TXD1	GPIO2_B4_d
GPIO2_B3_d	ENET1_TXD0	45	46	ENET1_CLK	GPIO2_B2_d
GPIO2_C0_d	ENET1_RXDV	47	48	ENET1_RXD1	GPIO2_B1_d
GPIO2_B0_d	ENET1_RXD0	49	50	GND	
GPIO3_A0_d	SDIO_CLK	51	52	SDIO_D0	GPIO3_A2_d
GPIO3_A3_d	SDIO_D1	53	54	SDIO_CMD	GPIO3_A1_d
GPIO3_A5_d	SDIO_D3	55	56	SDIO_D2	GPIO3_A4_d
	GND	57	58	IO_REV5	GPIO2_A1_d
GPIO2_A5_u	IO_REV6	59	60	IO_REV7	GPIO2_A2_u
GPIO2_A4_u	IO_REV8	61	62	IO_REV9	GPIO2_A3_u
GPIO2_A0_u	IO_REV10	63	64	GND	
IO_SDMMC_CD	IO_SDMMC_CD	65	66	IO_ENET2_nRST	IO_ENET2_nRST
SARADC_IN1	SARADC_IN1	67	68	SARADC_IN0	SARADC_IN0
	GND	69	70	ACODEC_ADC_INN	
	ACODEC_ADC_INP	71	72	GND	
	USB0_OTG_VDET	73	74	USB0_OTG_ID	
	USB0_OTG_DM	75	76	USB0_OTG_DP	
	GND	77	78	USB1_OTG_DM	
	USB1_OTG_DP	79	80	GND	
GPO4_A4_z	MIPI_DSI_CLKN	81	82	MIPI_DSI_CLKP	GPO4_A5_z
	GND	83	84	MIPI_DSI_D1N	GPO4_A2_z
GPO4_A3_z	MIPI_DSI_D1P	85	86	MIPI_DSI_D0N	GPO4_A0_z
GPO4_A1_z	MIPI_DSI_D0P	87	88	GND	
GPIO1_A0_d	IO_USB0_PWREN	89	90	IO_USBHUB_nRST	GPIO1_A1_d
GPIO1_A2_d	IO_4G_nRST	91	92	IO_4G_nDIS	GPIO1_A3_d

GPIO1_A4_d	IO_4G_PWREN	93	94	IO_LCD_nRST	GPIO1_A5_d
GPIO1_A6_d	IO_LCD_TP_nRST	95	96	IO_LCD_TP_nINT	GPIO1_A7_d
GPIO1_B0_d	IO_LCD_BL_PWREN	97	98	IO_WDT_FEED	GPIO1_B4_d
GPIO1_B5_d	IO_WDT_EN	99	100	IO_CAN_STBY	GPIO1_B6_d
GPIO1_B7_d	IO_SPK_nSD	101	102	IO_SPK_PWREN	GPIO1_C0_d
GPIO1_B3_d	SAI2_LRCK	103	104	SAI2_SCLK	GPIO1_B2_d
GPIO1_C1_d	SAI2_MCLK	105	106	SAI2_SDI	GPIO1_C2_d
GPIO1_C3_d	SAI2_SDO	107	108	IO_CH_SEL	GPIO1_C4_d
GPIO1_C5_d	IO_REV4	109	110	IO_REV3	GPIO1_C6_d
GPIO1_C7_d	IO_REV2	111	112	IO_REV1	GPIO1_D0_d
GPIO1_D1_d	UART5_nRTS	113	114	UART5_nCTS	GPIO1_B1_d
GPIO1_D2_d	UART5_TXD	115	116	UART5_RXD	GPIO1_D3_d
	GND	117	118	IO_RUN_LED	GPIO0_D0_d
	GND	119	120	UART0_RXD	UART0_RXD
UART0_TXD	UART0_TXD	121	122	GND	
GPIO0_C4_d	ENET2_CLK_25M	123	124	ENET1_CLK_25M	GPIO0_C3_d
GPIO0_C2_d	LCD_PWM_OUT	125	126	I2C2_SCL	GPIO0_C1_d
GPIO0_C0_d	I2C2_SDA	127	128	CAN1_TXD	GPIO0_B7_d
GPIO0_B6_d	CAN1_RXD	129	130	CAN0_TXD	GPIO0_B5_d
GPIO0_B4_d	CAN0_RXD	131	132	IO_RS485_DIR1	GPIO0_B3_d

J11: MIC input

PIN#	Signal Name
1	AUD_MIC+
2	AUD_MIC-

J12: Speaker output (amplifier output)

PIN#	Signal Name
1	SPK_OUTL_P
2	SPK_OUTL_N
3	SPK_OUTR_N
4	SPK_OUTR_P

J13: RS232

PIN#	Signal Name
1	COM1_TXD
2	COM1_RXD
3	GND
4	COM2_TXD
5	COM2_RXD
6	GND

J15: RS232

PIN#	Signal Name
1	COM3_TXD
2	COM3_RXD
3	GND
4	COM4_TXD
5	COM4_RXD
6	GND

J16: RS232

PIN#	Signal Name
1	COM5_TXD
2	COM5_RXD
3	GND
4	COM5_nRTS
5	COM5_nCTS
6	GND

J14: RS485

PIN#	Signal Name
1	RS485_1B
2	RS485_1A
3	GND
4	RS485_2B
5	RS485_2A
6	GND

J19/J18: CAN

PIN#	Signal Name
1	CANH
2	CANL
3	GND

J10: MIPI-DSI display interface

Signal Name	PIN#	PIN#	Signal Name
VCC_EXT_5V0	1	2	VCC_EXT_5V0

VCC_EXT_5V0	3	4	VCC_EXT_5V0
GND	5	6	GND
IO_LCD_TP_nINT	7	8	IO_LCD_TP_nRST
I2C2_SDA	9	10	I2C2_SCL
GND	11	12	IO_LCD_BL_PWREN
LCD_PWM_OUT	13	14	IO_LCD_nRST
GND	15	16	MIPI_DSI_D0_N
MIPI_DSI_D0_P	17	18	GND
MIPI_DSI_D1_N	19	20	MIPI_DSI_D1_P
GND	21	22	MIPI_DSI_CLK_N
LCD_DSI_CLKP	23	24	GND
	25	26	
GND	27	28	
	29	30	GND

J5: USB2.0 PHB HOST

PIN#	Signal Name
1	VCC_USB3_5V0
2	USB2_HOST1_DM_CON
3	USB2_HOST1_DP_CON
4	GND

S1: SIM card slot

PIN#	Signal Name
1	VCC_USIM
2	USIM_nRST

3	SIM_CLK
4	GND
5	NC
6	SIM_DATA

J17: GPIO

Signal Name	PIN#	PIN#	Signal Name
I/F_REV_IO1	1	2	I/F_REV_IO2
I/F_REV_IO3	3	4	I/F_REV_IO4
I/F_REV_IO5	5	6	I/F_REV_IO6
I/F_REV_IO7	7	8	I/F_REV_IO8
I/F_REV_IO9	9	10	I/F_REV_IO10
VCC_EXT_3V3	11	12	GND
VCC_EXT_3V3	13	14	GND

J9: MINI-PCIE

Signal Name	PIN#	PIN#	Signal Name
NC	1	2	VCC_4G_3V3
NC	3	4	GND
NC	5	6	NC
NC	7	8	4G_UIM_PWR
GND	9	10	4G_UIM_DATA
NC	11	12	4G_UIM_CLK
NC	13	14	4G_UIM_nRST
GND	15	16	NC

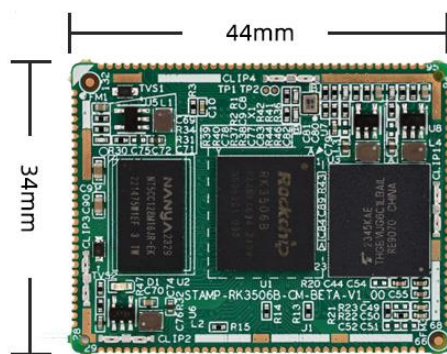
NC	17	18	GND
NC	19	20	4G_nDISEN
GND	21	22	4G_nRST
NC	23	24	VCC_4G_3V3
NC	25	26	GND
GND	27	28	NC
GND	29	30	NC
NC	31	32	NC
NC	33	34	GND
GND	35	36	4G_USB_D_N
GND	37	38	4G_USB_D_P
VCC_4G_3V3	39	40	GND
VCC_4G_3V3	41	42	4G_STATE
GND	43	44	NC
NC	45	46	NC
NC	47	48	NC
NC	49	50	GND
NC	51	52	VCC_4G_3V3

III. Size & Structure

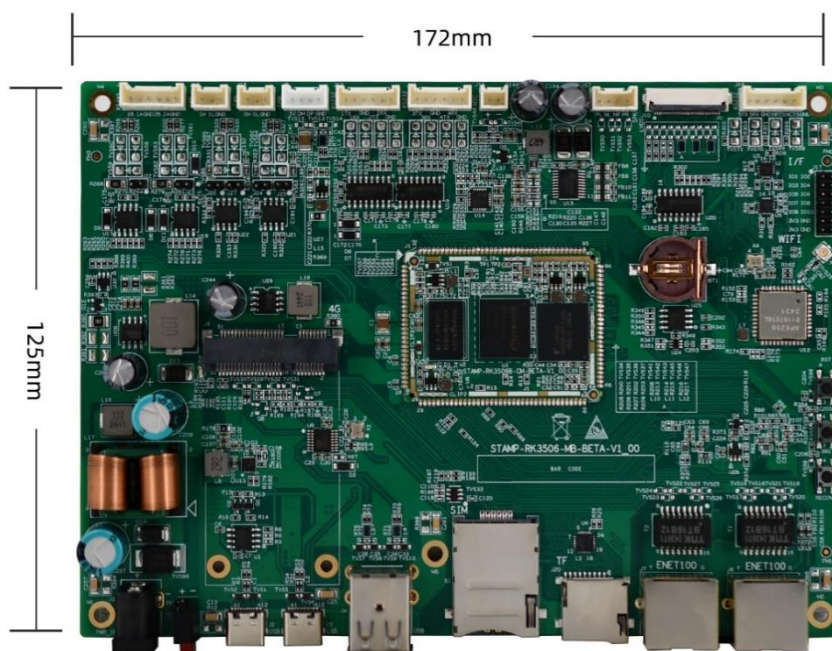
Unit: mm, if you need the size of the board -to -board receptacle, please email:

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3.1. Size of SOM Module



3.2. Size of Carrier Board



IV. Electrical Characteristics

Item	Features
Operation Temperature	0°C - +60°C
Storage Temperature	0°C - +70°C
Humidity	5% - 95%, non-condensation
SOM Size	44mm x 34mm, 6-layer high precision immersion gold process
Carrier Board Size	172mm x 125mm, 4-layer high precision immersion gold process
Power Consumption	<5W (non-loaded)
Power Supply	DC12V/2.5A

V. Remarks

1. Before connecting the LCD, please confirm the power specifications of your LCD module.

2. Please use the company's original connectors to avoid damage to the motherboard due to misconnection.

3. Our company promises to provide technical support services and lifelong maintenance services for our products via E-mail, telephone and other means of communication.

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Zhejiang Qiyang Intelligent Technology Co., Ltd.

Tel: +86-571-87858811 / 87858822

Fax: +86-571-89935912

Technical Support: +86-571-87858811 ext. 805

E-MAIL: supports@qiyangtech.com

Website: <http://www.qiytech.com>

ADD: 3rd Floor, Building A, WSCG Building, NO.6

Xiyuan 8th Road, Sandun Town, Xihu District,

Hangzhou City, Zhejiang China

Postal Code: 310030