STAMP-RK3506-CM

Hardware Manual

Version: V1.0
July 2025

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.

The production base in Zhuji provides a strong guarantee for Qiyang, covering an area of 5,000 square meters, with 2 SMT production lines, through and strictly follow the ISO9001 quality management system certification to guide production. Relying on the strong production strength, the annual production capacity can reach 1 million sets to ensure the delivery time of users and solve the worries.

Qiyang has a perfect sales and marketing network, professional sales and after-sales team to provide users with a full range of technical support and services. Business has spread to more than 120 countries and regions, successfully helping more than 2000 users to bring their products to market quickly and efficiently.

The combination and extension of R&D, production capacity and market has laid a solid foundation for Qiyang Intelligence to become a professional and global supplier of embedded software and hardware.

We offer:

- **Multi-platform software/hardware products**

NXP, Rockchip, MTK, Renesas, TI, Atmel, Cirrus Logic and other multi-platform ARM development boards/core boards/industrial control boards and peripheral hardware products, as well as supporting tools and software resources to support rapid secondary development of users.

- **Customized Services**

We fully utilize our accumulated technology on ARM platform and Linux, Android, Ubuntu and Debian operating systems to provide customized embedded product services (OEM/ODM).

Thank you for using Qiyang's products, we will do our best to provide you with technical assistance! Wish you good luck in your work!

Technical Support

If you have questions about the documents, you can contact us during office hours (Monday to Friday 8:30-12:00, 13:30-17:30)

Contact us at

Technical Email：supports@qiyangtech.com

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

Official website：www.qiytech.com(Chinese）/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

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 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) we accept bulk orders for the STAMP-RK3506-CM core board.

Version Record

Version No.	Hardware Platform	Date	Description	Revised by
V1.0	STAMP-RK3506-CM V1.00	2025-07	Initial version	Maoh

Contents

NOTE: The manual mainly introduces the hardware interface of the STAMP-RK3506-CM core board

I. System Composition

1.1. Chip Overview

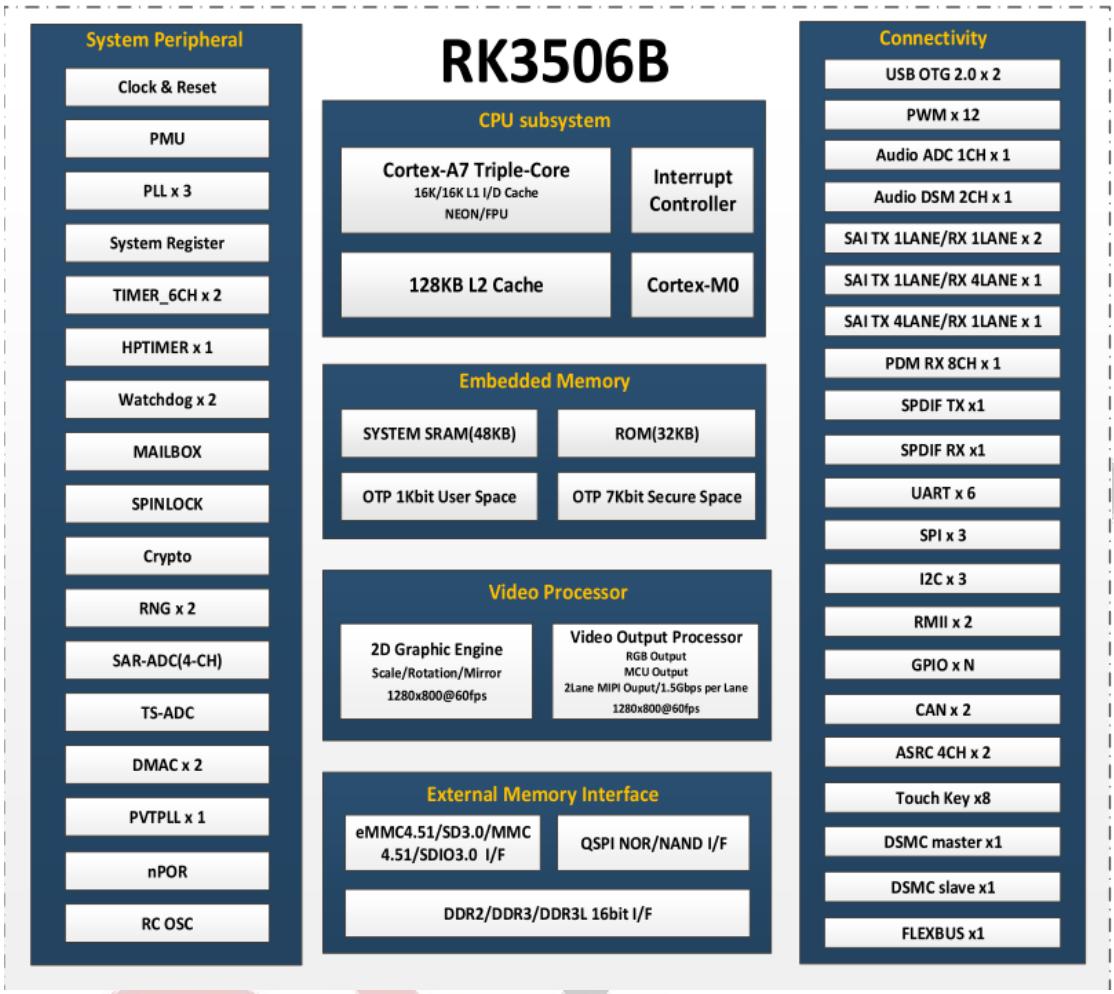
RK3506B is a high-performance triple-core Cortex-A7 application processor designed for smart voice interaction, audio input/output processing, image output processing and other digital multimedia applications.

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.

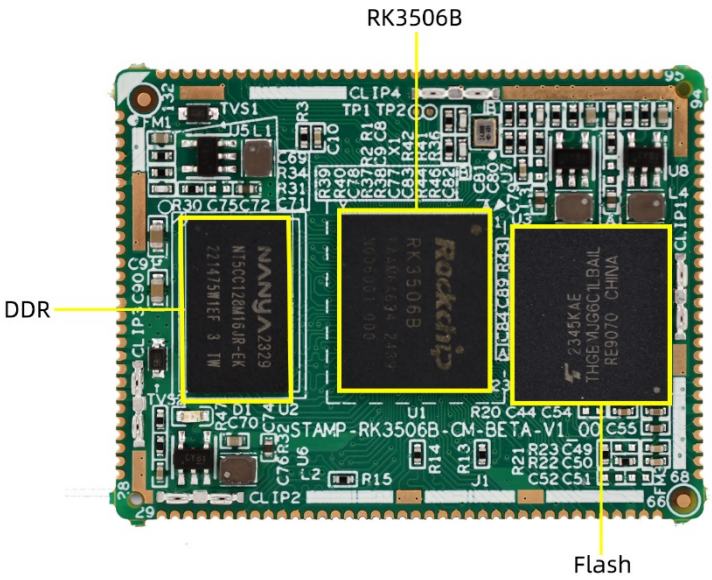
RK3506B has a high-performance external memory interface (DDR2/DDR3/DDR3L) capable of sustaining demanding memory bandwidth, and RK3506G also integrates 64MB of DDR2 for customers to use.

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. SOM 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 RMII, supports 10M/100M Ethernet
	Connectivity	6-ch UART, including 1-ch debug serial port CPU UART rate can support up to 4Mbps
		1-ch SDIO interface, compliant with SDIO 3.0 protocol
		2-ch CAN interface, compliant with CAN 2.0B protocol
		1-ch I2C interface
	Display	1-ch 2-lane MIPI_DSI display interface, resolution up to 1280x1280@60
	Audio	1-ch SAI interface 1-ch audio ADC input interface
	USB	1-ch USB2.0 OTG interface 1-ch USB2.0 HOST interface
	Camera	2-ch MIPI-CSI (4 lanes), supports two cameras input simultaneously
	Other Features	Several GPIO interfaces (3.3V) 2-ch ADC interface (1.8V)
	Power Input	+5V power supply
Electricity	Layer/Size	SOM Size: 44mm x 34mm, 6-layer high precision immersion gold technology
	Power Consumption	The power consumption of the whole board is 5W (non-loaded)
	Operation Temperature	0℃ - +70℃
	Storage Temperature	-10℃ - +85℃
	Humidity	5% - 95%, non-condensation
	SOM Options	Standard option: 256MB DDR/8GB eMMC (0℃ ~ +70℃) TODO

1.4. PIN Definition

Note: For detailed core board pin information, please refer to "STAMP-RK3506-CM Core Board Pin Description"

Counterclockwise (core board interface pin)

PIN#	Signal Name	SOC PIN	Direction	Power Domain
1	UART1_TXD	R3	OUT	3.3V
2	UART1_RXD	R1	IN	3.3V
3	IO_RS485_DIR2	R2	I/O	3.3V
4	GND	\	\	\
5	CPU_nPOR	T3	OUT	3.3V
6	GND	\	\	\
7	UART2_TXD	T2	OUT	3.3V
8	UART2_RXD	U3	IN	3.3V
9	UART3_TXD	U1	OUT	3.3V
10	UART3_RXD	U2	IN	3.3V
11	UART4_TXD	V2	OUT	3.3V
12	UART4_RXD	V3	IN	3.3V
13	IO_EXT_PWREN	W2	I/O	3.3V
14	IO_ENET1_nRST	W1	I/O	3.3V
15	VCC_SYS_5V0	/	/	/
16	VCC_SYS_5V0	/	/	/
17	VCC_SYS_5V0	/	/	/
18	VCC_SYS_5V0	/	/	/
19	GND	/	/	/
20	GND	/	/	/

21	GND	/	/	/
22	GND	/	/	/
23	VCC_1V8	/	/	/
24	VCC_1V8	/	/	/
25	VCC_3V3	/	/	/
26	VCC_3V3	/	/	/
27	GND	/	/	/
28	GND	/	/	/
29	ENET2_MDIO	P21	I/O	1.8V
30	ENET2_MDC	P23	OUT	1.8V
31	GND	/	/	/
32	ENET2_TXEN	P22	OUT	1.8V
33	ENET2_TXD1	N21	OUT	1.8V
34	ENET2_TXD0	M21	OUT	1.8V
35	ENET2_CLK	M23	I/O	1.8V
36	ENET2_RXDV	R22	IN	1.8V
37	ENET2_RXD1	M22	IN	1.8V
38	ENET2_RXD0	L22	IN	1.8V
39	GND	/	/	/
40	ENET1_MDIO	G21	I/O	3.3V
41	ENET1_MDC	F22	OUT	3.3V
42	GND	/	/	/
43	ENET1_TXEN	F23	OUT	3.3V
44	ENET1_TXD1	F21	OUT	3.3V
45	ENET1_TXD0	E22	OUT	3.3V
46	ENET1_CLK	E21	I/O	3.3V
47	ENET1_RXDV	G22	IN	3.3V

48	ENET1_RXD1	D23	IN	3.3V
49	ENET1_RXD0	D21	IN	3.3V
50	GND	/	/	/
51	SDIO_CLK	K21	OUT	1.8V
52	SDIO_D0	K23	I/O	1.8V
53	SDIO_D1	K22	I/O	1.8V
54	SDIO_CMD	J21	I/O	1.8V
55	SDIO_D3	H22	I/O	1.8V
56	SDIO_D2	H23	I/O	1.8V
57	GND	/	/	/
58	IO_REV5	C22	I/O	3.3V
59	IO_REV6	E20	I/O	3.3V
60	IO_REV7	C23	I/O	3.3V
61	IO_REV8	B23	I/O	3.3V
62	IO_REV9	C21	I/O	3.3V
63	IO_REV10	B22	I/O	3.3V
64	GND	/	/	/
65	IO_SDMMC_CD	B21	I/O	1.8V
66	IO_ENET2_nRST	A21	I/O	1.8V
67	SARADC_IN1	B20	I/O	1.8V
68	SARADC_IN0	A20	I/O	1.8V
69	GND	/	/	/
70	ACODEC_ADC_INN	B19	I/O	/
71	ACODEC_ADC_INP	A19	I/O	/
72	GND	/	/	/
73	USB0_OTG_VDET	B18	IN	3.0V
74	USB0_OTG_ID	B17	IN	1.8V

75	USB0_OTG_DM	B16	I/O	/
76	USB0_OTG_DP	A16	I/O	/
77	GND	/	/	/
78	USB1_OTG_DM	A15	I/O	/
79	USB1_OTG_DP	B15	I/O	/
80	GND	/	/	/
81	MIPI_DSI_CLKN	B14	OUT	/
82	MIPI_DSI_CLKP	B13	IN	/
83	GND	/	/	/
84	MIPI_DSI_D1N	B12	OUT	/
85	MIPI_DSI_D1P	A12	IN	/
86	MIPI_DSI_D0N	A11	OUT	/
87	MIPI_DSI_D0P	B11	IN	/
88	GND	/	/	/
89	IO_USB0_PWREN	B10	I/O	3.3V
90	IO_USBHUB_nRST	1A5	I/O	3.3V
91	IO_4G_nRST	A9	I/O	3.3V
92	IO_4G_nDIS	B9	I/O	3.3V
93	IO_4G_PWREN	B8	I/O	3.3V
94	IO_LCD_nRST	1A4	I/O	3.3V
95	IO_LCD_TP_nRST	A7	I/O	3.3V
96	IO_LCD_TP_nINT	B7	I/O	3.3V
97	IO_LCD_BL_PWREN	1A3	I/O	3.3V
98	IO_WDT_FEED	1A1	I/O	3.3V
99	IO_WDT_EN	C3	I/O	3.3V
100	IO_CAN_STBY	A3	I/O	3.3V
101	IO_SPK_nSD	B3	I/O	3.3V

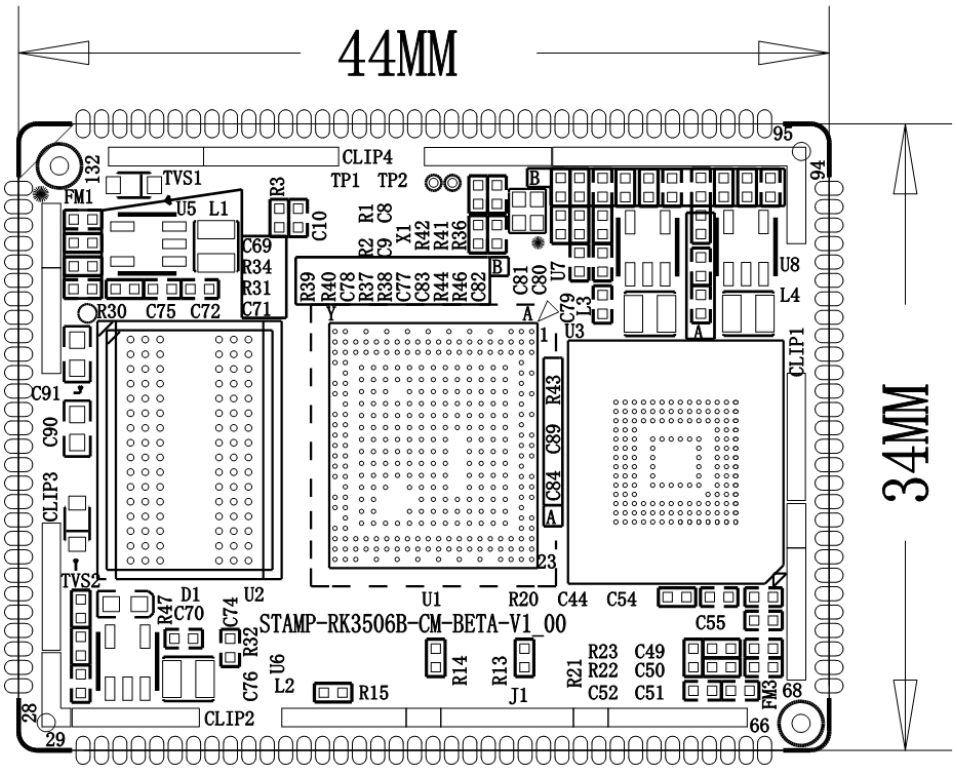
102	IO_SPK_PWREN	A2	I/O	3.3V
103	SAI2_LRCK	B5	I/O	3.3V
104	SAI2_SCLK	A5	I/O	3.3V
105	SAI2_MCLK	B2	I/O	3.3V
106	SAI2_SDI	B1	IN	3.3V
107	SAI2_SDO	C2	OUT	3.3V
108	IO_CH_SEL	C1	I/O	3.3V
109	IO_REV4	D3	I/O	3.3V
110	IO_REV3	E3	I/O	
111	IO_REV2	E2	I/O	
112	IO_REV1	E1	I/O	
113	UART5_nRTS	F3	OUT	3.3V
114	UART5_nCTS	1A2	IN	3.3V
115	UART5_TXD	F2	OUT	3.3V
116	UART5_RXD	G3	IN	3.3V
117	GND	/	/	/
118	IO_RUN_LED	G1	I/O	1.8V
119	GND	/	/	/
120	UART0_RXD	J1	IN	3.3V
121	UART0_TXD	J2	OUT	3.3V
122	GND	/	/	/
123	ENET2_CLK_25M	K2	OUT	/
124	ENET1_CLK_25M	L2	OUT	/
125	LCD_PWM_OUT	L1	OUT	3.3V
126	I2C2_SCL	M3	OUT	3.3V
127	I2C2_SDA	M2	I/O	3.3V
128	CAN1_TXD	N2	OUT	/

129	CAN1_RXD	N3	IN	/
130	CAN0_TXD	N1	OUT	/
131	CAN0_RXD	P3	IN	/
132	IO_RS485_DIR1	P2	I/O	3.3V

II. Size & Structure

Unit: mm, if you need the size of the board to board receptacle, please email:
supports@qiyangtech.com

2.1. Size of SOM Module



III. Electrical Characteristics

Item	Features
Operation Temperature	0℃...+70℃
Storage Temperature	-10℃...+85℃
Humidity	5% - 95%, non-condensation
SOM Size	44mm x 34mm, 6-layer high precision immersion gold process
Power Consumption	5W (non-loaded)
Power Supply	DC5V/3A

IV. 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 shall provide technical support services and lifelong maintenance services for our products via E-mail, telephone and other means of communication.

4. Our company shall provide free maintenance service for our products within 6 months from the date of sale. If the users encounter a failure due to product quality problems during the use of our products, they can contact the seller or our company with the purchase receipt during the warranty period, and our company will be responsible for repairing the product or replacing it with a new one.

5. Under these circumstances, we do not offer free maintenance:

- expired warranty service period;
- no valid purchase receipt;
- the damage was caused by liquid, moisture or mold;
- failures and damages after purchase caused by reasons other than product quality, such as falling, strong vibration, unauthorized modification, misoperation, etc.;
- damage was caused by force majeure.

6. Our company reserves the intellectual property rights of all software and hardware technical materials developed for the STAMP-RK3506-CM product; users can only use them for teaching, experiments, and scientific research, and may not engage in any commercial purposes, distribute them on the Internet, or tamper with their copyright by intercepting, modifying, etc.

7. We accept batch orders and offer technical support and service.