

FET3506J-C/FET3506B-C SoM

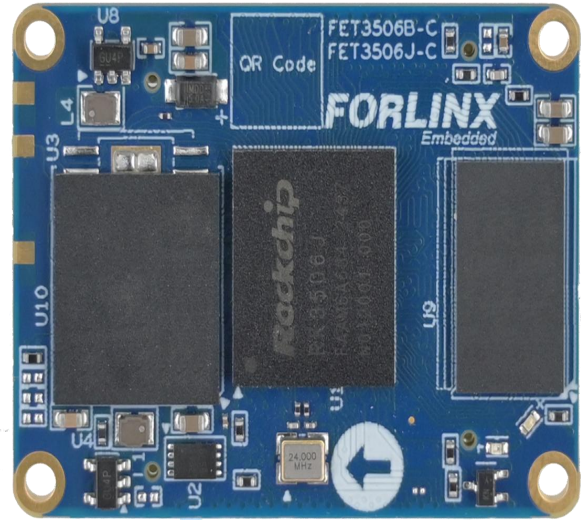
The FET3506J-C/FET3506B-C SoMs are developed and designed based on the Rockchip RK3506 processor. It is a low-power, cost-effective application processor designed for industrial automation and consumer electronics devices.

It integrates three high-performance ARM Cortex-A7 cores, an embedded 2D hardware engine, and a display output engine, which are used to minimize CPU consumption and meet the requirements of image display. It features a rich variety of peripheral interfaces, providing more application options.

It uses pluggable board-to-board connection design, which not only facilitates product production and assembly, but also facilitates later maintenance and upgrading. It has undergone thorough testing in industrial environments by Forlinx Embedded Laboratory to ensure stability and reliability. 10 to 15 years longevity, ensuring a consistent supply over time.

■ Product Features:

- 2 x 80 pin board-to-board connectors that lead out all the function pins from the processor
- 22nm manufacturing process technology
- Display interfaces: MIPI DSI and RGB
- Industrial bus interfaces: RMII, CAN - FD, FLEXBUS, and DSMC
- Supports the DSMC parallel bus for easy connecting with FPGA and DSP
- Supports the RM_IO for the configuration of functional pins in a matrix



SoM (with eMMC storage), the NAND version varies from the illustration.

3×A7+1×M0 CPU	22nm Manufacturing Process Technology	29×40mm Compact Size
Up to 1.6GHz Clock	2×CAN-FD CAN	

■ SoM Parameters

Processor	Rockchip RK3506J	Rockchip RK3506B
ARM:	3×Cortex-A7, up to 1.5GHz 1×Cortex-M0, 200MHz	3×Cortex-A7, up to 1.6GHz 1×Cortex-M0, 200MHz
NPU:	No	
GPU:	2D GPU	
VPU:	No	
RAM	256MB/512MB DDR3	/
ROM	256MB Nand Flash/8GB eMMC	/
Operating Temperature	-40°C~+85°C	/
Working Voltage	DC 5V	
Connection	Board-to-board connector (2 × 80PIN, pin pitch 0.5mm, combined height 2.0mm)	

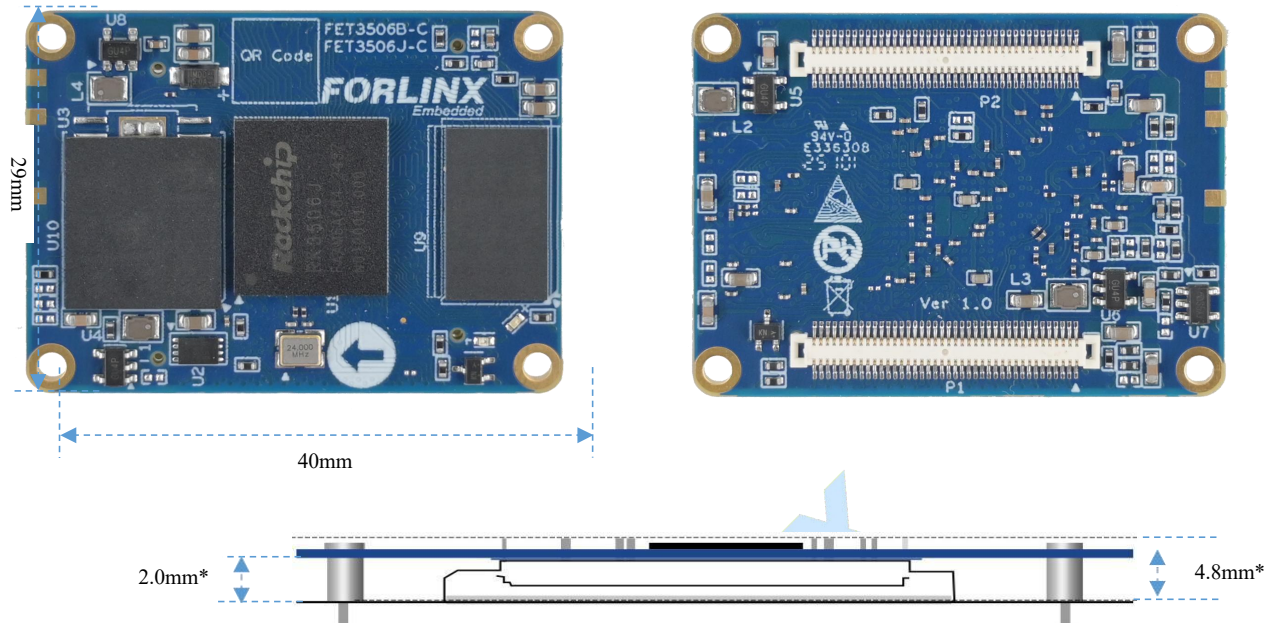


■ Function Parameters:

Function	Quantity	Parameter	
MIPI DSI	≤1	Supports 1 x 2-lane MIPI display serial interface, 1.5Gbps/Lane;	1 x built-in VOP (Video Output Processor) controller, no support for multi-display or heterogeneous display;
RGB	≤1	RGB 888 24-bit support up to 1280x1280 @ 60Hz;	
FLEXBUS	≤1	Supports 1 flexible parallel FLEXBUS interface for high-speed IO switching	
DSMC	≤1	Supports the DSMC data bus for PSRAM and FPGA communication and expansion; Supports master and slave modes. The master mode supports × 8 and × 16 data bit modes, and the slave mode supports × 8 data bit mode.	The RGB, FLEXBUS, and DSMC interfaces are multiplexed, only one can be used at a time.
USB 2.0	2	Supports 2 x Hi-Speed USB 2.0 with 1 USB for OTG	
SDMMC	≤1	Supports 1 set of SDIO, 4 bits (not available on eMMC SoM)	
Ethernet	2	2×RMII, 10/100-Mbps, supports full-duplex and half-duplex operation	
CAN-FD	2	Supports CAN2.0 and CAN-FD	
SPI	3	SPI0/SPI1 support both serial master and slave modes, configurable via software. SPI2 supports serial slave mode only	
UART	≤6	Supports six serial communication interfaces, with UART0 serving as the debugging serial port.	
I2C	3	Supports both 7bits and 10bits address modes, master and slave modes, with a maximum data rate of 1 Mbit/s	
Audio	/	4×SAI (TX 1Lane/RX 1Lane×2, TX 4Lane/RX 1Lane×1, TX 1Lane/RX 4Lane×1) 1×4ch PDM 1×SPDIF TX/RX 1×Audio ADC 2×Audio DSM	
FSPI	≤1	Supports 1 x FSPI interface. The SoM is connected to SPI NAND FLASH by default, enabling system startup.	
SARADC	≤4	10bits resolution, a maximum sampling rate of 1 MS/s, and an input voltage range of 0 to 1.8 V; SARADC0 are related to the startup, and SARADC1 is multiplexed for the recovery interface function.	
PWM	≤11	Supports 12 x PWM interfaces. 1 x is already occupied by the SoM, so 11 x are available	
JTAG	≤1	Supports JTAG SWD interface debugging, and the pins are multiplexed with the debugging serial port UART0	
TOUCH KEY	≤8	Supports 8 x TOUCH KEY	
GPIO	≤76	GPI≤70, GPO≤76, MIPI_DPHY_DSI_TX_D0N/D0P/D1N/D1P/CLKN/CLKP can only be used as GPO	

Note: The parameters in the table are the theoretical values of hardware design or CPU.

■ Appearance & Dimension:



* Note: PCB thickness is 1.6mm and dimensional tolerance is $\pm 0.2\text{mm}$.

■ Software Support:

OS	Linux6.1.99+Qt5.15.11
Flashing	USB OTG

■ Peripheral Support List:

Linux 6.1.99 Drive Support List	Interface	Function	Plan
	USB	Wi-Fi/BT	8723DU
	I2C	RTC	PCF8563, RX8010
	I2C	Touch	FT3427, ft5x06, tsc2007, GT928
	MIPI-DSI	7-inch capacitive touch screen	Resolution 1024 × 600, touch chip FT3427
	RGB	7-inch capacitive touch screen	Resolution 1024 × 600, touch chip ft5x06
	RMII	Ethernet	YT8512H, YT8522H
	USB	4G	EC20
	UART	General	
	CAN	General	
	PWM	General	LCD Backlight

■ Product Materials:

Linux6.1.99	User's Manual, User's Compilation Manual, Factory Image, Kernel Source Code, Test Program Source Code, File System, Driver Tool, Download Tool, Burning Tool, Development Environment.
Hardware Materials	Hardware Manual, Pin Multiplexing Comparison Table, Pin Function Comparison Table, SoM STEP File, Carrier Board STEP File, SoM DXF File, Carrier Board DXF File, Carrier Board PDF Schematic, Carrier Board PCB Source File, Carrier Board Design Data.

* Forlinx will keep providing more product information.

■ Order Model List:

Specification Model	Core	CPU Clock	RAM	ROM	Operating Temperature	Supply
FET3506J-C+15256SN2 56Ixx: xx	3×A7	Up to 1.5GHz	256MB	256MB Nand Flash	-40°C~+85°C	Mass Production
FET3506J-C+15512SE8 GIxx: xx	3×A7	Up to 1.5GHz	512MB	8GB eMMC	-40°C~+85°C	Mass Production
FET3506J-C+151GSE8 GIxxx: xx	3×A7	Up to 1.5GHz	1GB	8GB eMMC	-40°C~+85°C	Plan
FET3506B-C+16256SN 256Cxx: xx	3×A7	Up to 1.6GHz	256MB	256MB Nand Flash	0°C~+80°C	Plan
FET3506B-C+16512SN 512Cxx: xx	3×A7	Up to 1.6GHz	512MB	512MB Nand Flash	0°C~+80°C	Plan

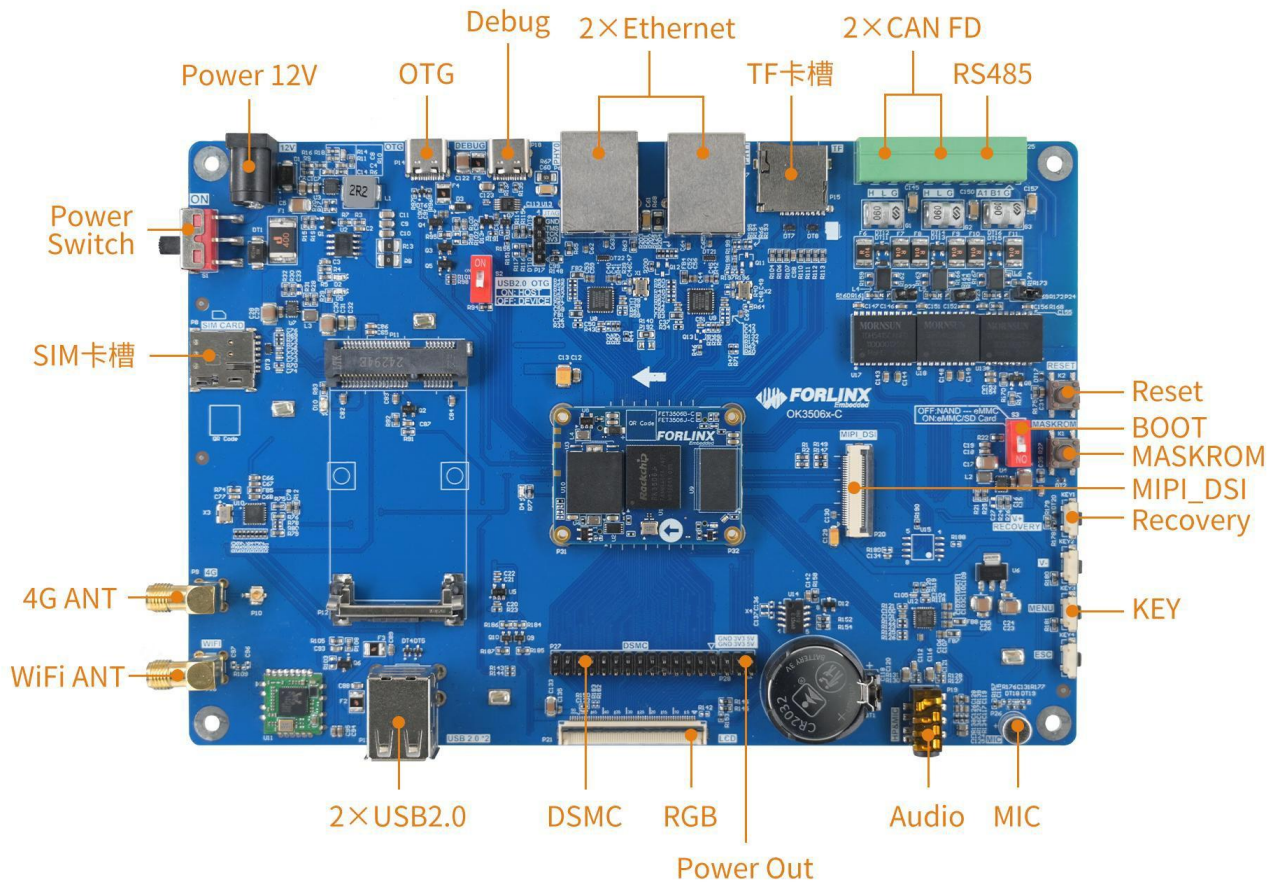
■ SoM Naming Rules:

A B - C + D E F G H I J : K L

This table describes SoM number terms to define its characteristics (e.g., CPU, frequency, temperature grade, version).

Field	Field Description	Value	Description
A	Product Line Identification	FET	Forlinx Embedded SoM
		FL	Forlinx Embedded All in One Panel
B	CPU Name	3506J	RK3506J
		3506B	RK3506B
-	Segment Identification	-	
C	Connection	C	Board to Board Connector
+	Segment Identification	+	The configuration parameter section follows this identifier.
D	CPU Clock (Max.)	16	1.6GHz
		15	1.5GHz
E	RAM (Unit: Byte)	256	256MB
		512	512MB
		1G	1GB
		2G	2GB
F	Single ROM Type	SN	Nand Flash
		SE	eMMC
G	Single ROM Capacity (Unit: Byte)	256	256MB
		512	512MB
		8G	8GB
H	Operating Temperature	C	0 to 80°C Commercial-grade
		E	-20 to 80°C
		I	-40 to 85°C Industrial-grade
I	Configuration No.	A~Z	If the D ~ H field values of each product are the same, the field values are the same, in ascending order according to the configuration release time
J	PCB Version	10	V1.0
		11	V1.1
		xx	Vx.x
:	Separator	:	It is followed by the internal identification of the manufacturer, which has no effect on the use.
KL	Internal Identification of the Manufacturer	xx	It is the internal identification of the manufacturer and has no impact on the use.

■ Development Board:



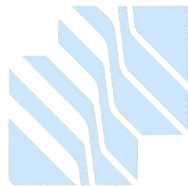
■ Function Parameters:

Function	Quantity	Parameter	
MIPI DSI	1	Single-channel output, 2Lane. Currently, there is no compatible screen.	1 x built-in VOP (Video Output Processor) controller, no support for multi-display or heterogeneous display;.
RGB	1	Supports RGB 888 24bit, up to 1280x1280 @ 60Hz	
USB OTG	1	Type - C connector. The master - slave DIP switch is used for downloading and programming.	
USB 2.0	2	Supports 2 x high - speed USB2.0 Type - A connectors	
TF card	1	One set of SDIO is used for an external TF card. It shares pins with the SoM's eMMC and is only available on the SPI NAND version of the SoM.	
4G	1	1 x mini PCIe connector is used for an external 4G module, using the USB2.0 interface.	
Wi-Fi	1	1 x WIFI&BT module RTL8723DU, using the USB 2.0 interface.	
Bluetooth	1		
Ethernet	2	Supports 2 x 10/100 - Mbps network ports with RMI interfaces	
Audio	1	A four-segment audio interface with a two-channel headphone output and a microphone input, plus an on-board MIC.	
CAN-FD	2	Supports CAN and CAN-FD	
RS485	1	Support 1 x RS485 interface with quarantine and protection	
FSPI	1	Multiplex with the SPI Nand Flash pin of the SoM, default empty soldering	
RTC	1	I2C interface, onboard RTC chip and coin-cell battery holder	
DEBUG	1	USB to serial port for output of debug information, Type-C connector	
JTAG	1	Led out via pin headers, supports JTAG interface debugging, and shares pins with the debugging serial port	
KEY	6	Reset Maskrom VOL+, VOL- MENU ESC	

Note: The parameters in the table are the theoretical values of hardware design or CPU.

■ Power Consumption:

No.	Test Item	SoM Power (W)	Development Board Power (including SoM) (W)
1	No load	0.271	1.416
2	USB Read and Write	0.351	1.956
3	4G Module PING Network	0.272	1.536
4	TF Read and Write	0.363	1.536
5	PING Network	0.324	1.956
6	7-inch LCD screen with load	0.404	3.72
7	7-inch MIPI screen with load	0.358	3.936
8	CPU with full load	0.724	1.932



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