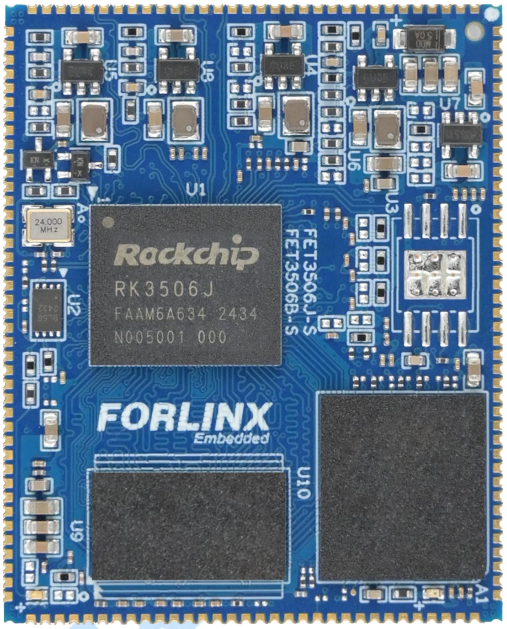
FET3506J-S/FET3506B-S SoM

FET3506J - S/FET3506B - S SoMs are based on Rockchip RK3506, a low - power, cost - effective processor for industrial & consumer devices. It integrates 3 ARM Cortex - A7 cores, a 2D hardware engine and a display output engine to cut CPU use for image display. Rich interfaces provide more applications options. Edge Connector providing a more secure connection.

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.



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

3×A7 CPU	22nm Manufacturing Process Technology	35×44mm Compact Size
Up to 1.6GHz Clock	2×CAN-FD CAN	

Product Features:

- All the functional pins of the processor are led out by using the edge connector
- 22nm manufacturing process technology
- Display interfaces: MIPI DSI and RGB
- Industrial bus interfaces: RMII, CAN - FD, FLEXBUS, and DSMC
- DSMC can be used to extend PSRAM, FPGA communication
- RM _ IO enables matrix configuration pin functionality

SoM Parameters

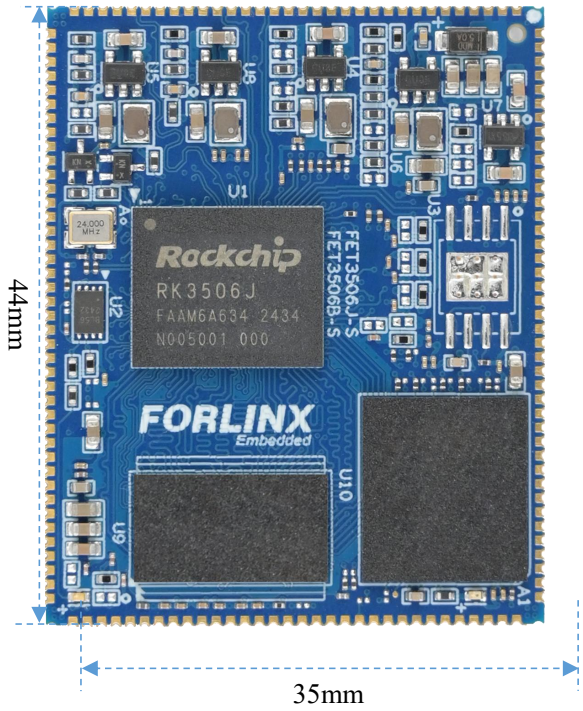
Processor		**Rockchip RK3506J**	**Rockchip RK3506B**
	ARM:	3×Cortex-A7, up to 1.5GHz	3×Cortex-A7, up to 1.6GHz
	NPU:	**No**	
	GPU:	2D GPU	
	VPU:	**No**	
RAM		256MB/512MB DDR3	256MB/512MB DDR3
ROM		256MB Nand Flash/8GB eMMC	256MB/512MB Nand Flash
Operating Temperature		-40℃~+85℃	0℃~+80℃
Working Voltage		DC 5V	
Connection		Edge connector (total 146 pins are led out, pin-to-pin spacing 1mm)	

SoM 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, only support for 1 x display output at the same time.	
RGB	≤1	RGB 888 24-bit, up to 1280x1280 @ 60Hz		The RGB, FLEXBUS, and DSMC interfaces are multiplexed, only one can be used at a time.
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		
USB 2.0	2	Supports 2 x Hi-Speed USB 2.0 with 1 x 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 1.2mm; total height of PCBA is 2.3mm; dimensional tolerance is ± 0.2mm.

Software Support:

OS	Linux6.1.99+Qt5.15.11, AMP
Flashing	USB OTG

Peripheral Support List:

Linux 6.1.99	**Interface**	**Function**	**Plan**
Drive Support List	**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
	LCD	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 Documentation List:	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 Documentation List	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.

Note: The documentation will be gradually provided and enriched after the product is released.

Order Model List:

Specification Model	Core	CPU Clock	RAM	ROM	Operating Temperature	Supply
FET3506J-S+15256SN256Ixx: xx	3×A7	Up to 1.5GHz	256MB	256MB Nand Flash	-40℃~+85℃	Mass Production
FET3506J-S+15512SE8GIxx: xx	3×A7	Up to 1.5GHz	512MB	8GB eMMC	-40℃~+85℃	Mass Production
FET3506J-S+151GSE8GIxxx: xx	3×A7	Up to 1.5GHz	1GB	8GB eMMC	-40℃~+85℃	Plan
FET3506-S+15256SN256Cxx: xx	3×A7	Up to 1.6GHz	256MB	256MB Nand Flash	0℃~+80℃	Plan
FET3506-S+15512SE8GCxx: xx	3×A7	Up to 1.6GHz	512MB	8GB eMMC	0℃~+80℃	Plan

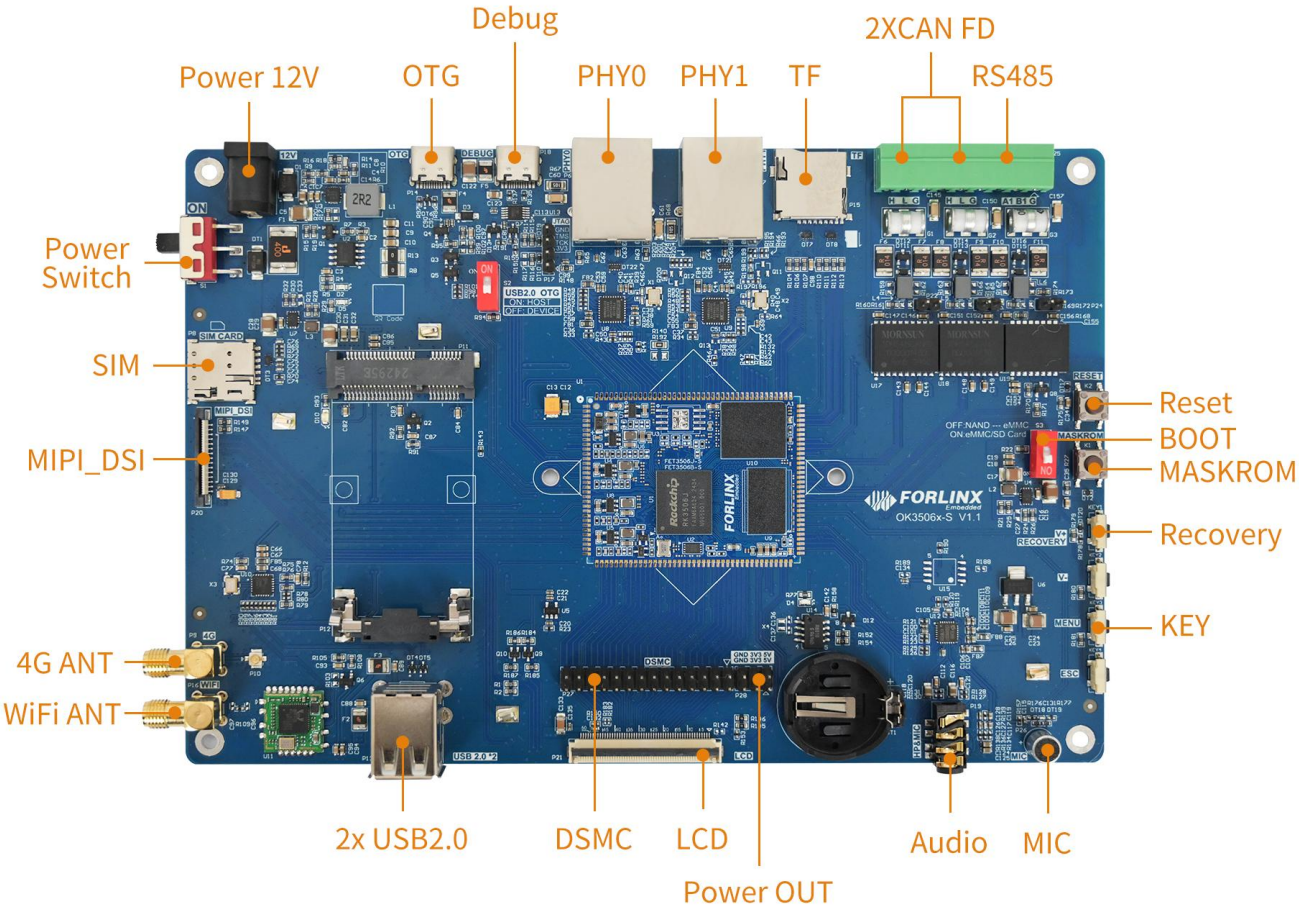
SoM Naming Rules:

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
		3506	RK3506B
-	**Segment Identification**	-	
C	**Connection**	S	Edge Connector
+	**Segment Identification**	+	The configuration parameter section follows this identifier.
D	**CPU Clock (Max.)**	16	1.6GHz
		15	1.5GHz
E	**RAM Capacity (Unite：Byte)**	256	256MB
		512	512MB
		1G	1GB
		2G	2GB
F	**Single ROM Type**	SN	Nand Flash
		SE	eMMC
G	**Single ROM Capacity (Unite：Byte)**	256	256MB
		8G	8GB
		16G	16GB
H	**Operating Temperature**	C	0 to 70℃ Commercial-grade
		E	-20 to 80℃
		I	-40 to 85℃ 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**	:	This symbol is followed by the internal identification of the manufacturer, which has no effect on the use.
KL	**Internal Identification of the Manufacturer**	xx	This is the internal identification of the manufacturer and has no impact on the use.

Development Board:



Development Board Function Parameters:

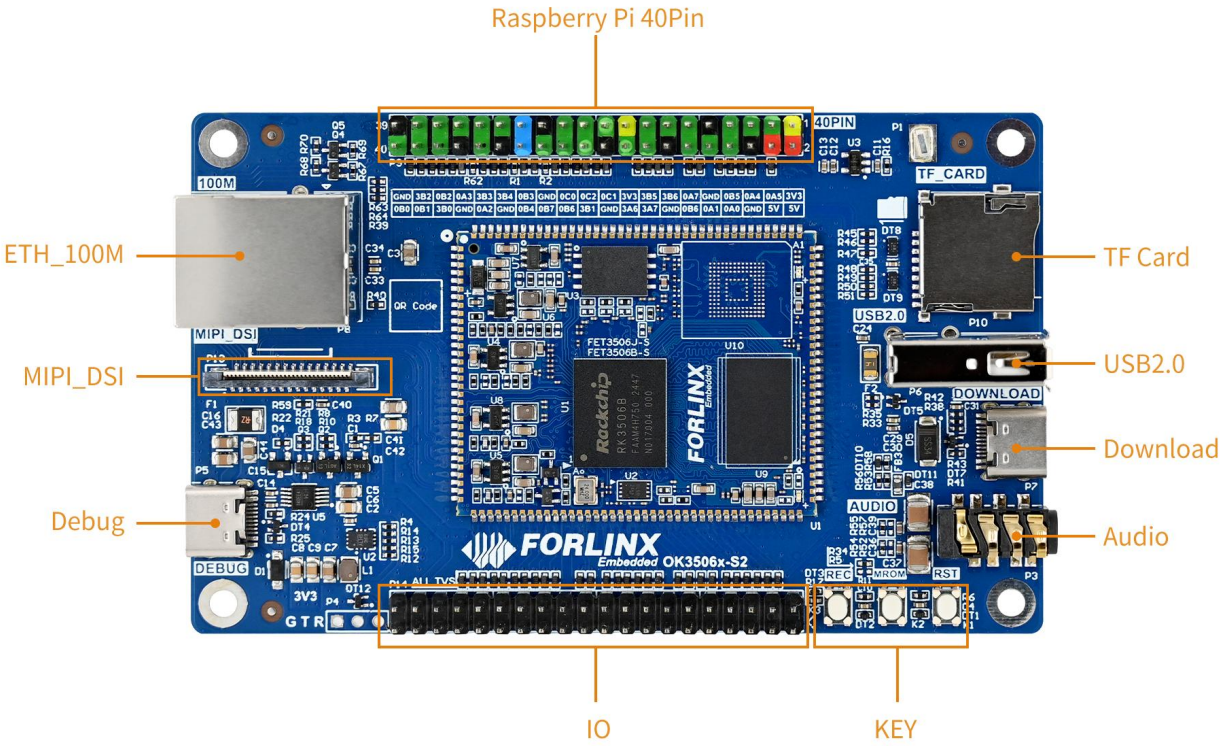
Function	Quantity	Parameter	
MIPI DSI	1	Single-channel output, 2Lane. Currently, there is no compatible screen.	1 x built-in VOP (Video Output Processor) controller, only support for 1 x display output at the same time.
RGB	1	Supports RGB 888 24bit, up to 1280x1280 @ 60Hz	
USB OTG	1	Type - C connector. 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 RMII interfaces	
Audio	1	A four-segment audio interface with a two-channel headphone output and a MIC 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

Mini Development Board:



Mini Development Board Function Parameters:

Function	Quantity	Parameter
MIPI-DSI	1	FPC socket lead-out, 2-lane MIPI-DSI, support capacitive touch and backlight adjustment
OTG	1	POWER+OTG，TYPE-C lead-out, support USB programming firmware
DEBUG	1	POWER+DEBUG，TYPE-C lead-out
40PIN Raspberry Pi	1	Compatible with Raspberry Pi 40 PIN IO, pin out
Audio	1	Stereo headphone output, headphone recording
40PIN IO	1	Pin lead-out, can be multiplexed into LCD and DSMC functions
TF Card	1	Supports Nand version only, speed up to SDR52
Network port	1	100M
KEY	3	RESET,MASKROM,RECOVERY
USB	1	USB 2.0

*** Note: MPI-DSI and LCD are multiplexed and can only be used alternatively; DSMC and LCD cannot be used at the same time.**

