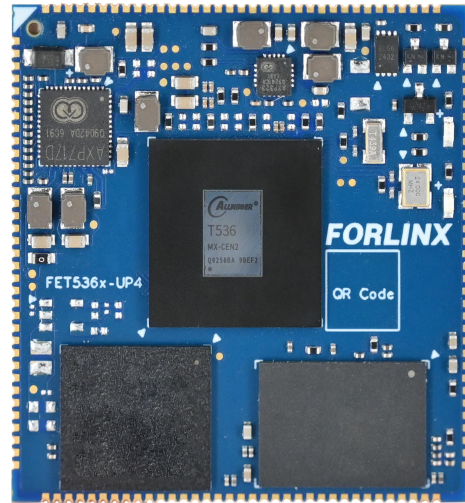


FET536-UP4 SoM

FET536-UP4 SoM series development board - designed based on Allwinner T536 industrial-grade processor. The T536 features a main frequency of 1.6 GHz and integrates a quad-core Cortex-A55 processor alongside a 64-bit XuanTie E907 RISC-V MCU. It offers efficient computing power. The T536 also includes a 2 TOPS NPU (Neural Processing Unit), secure boot capability, support for national cryptographic algorithms, full-path ECC (Error Correcting Code), AMP (Asymmetric Multi-Processing), and runs on Linux-RT. Additionally, it provides a wide array of connectivity options, including USB, SDIO, UART, SPI, CAN-FD, Ethernet, ADC, and LocalBus. It features a cost-effective processor; the entire SoM employs industrial-grade components, making it an excellent choice for achieving cost reduction in key fields such as concentrators, FTU, DTU, charging stations, transportation, robotics, and industrial control.

■ Product Features:

- 2 TOPS NPU and ECC;
- 4 x CAN - FD and 17 x UART;
- Rich product configurations are available, with options of 1GB/2GB/4GB;
- ARM + RISC - V multi - core heterogeneous architecture, suitable for various scenario requirements;
- High - speed parallel bus LocalBus;
- LCC+LGA package (compact size);
- Universal package and is compatible with the UP4 series of SoMs.



FET536-UP4 SoM

ARM+RISC-V Multi-core heterogeneous	4×1.6GHz Clock	2TOPS NPU
UP4 package Compatibility	LocalBus Parallel Bus	600MHz RISC-V

■ SoM Parameters:

Processor	Allwinner T536 CPU: 4×Cortex-A55 NPU: 2TOPS
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	RISC-V: XuanTie E907@600MHz VPU: Video decoding · MJPEG up to 4K@15fps · JPEG up to 1080p@60fps Video encoding · H.264 BP/MP/HP up to 4K@25fps · MJPEG up to 4K@15fps · JPEG up to 8K×8K
RAM	1GB/2GB/4GB LPDDR4
ROM	8GB/16GB/32GB eMMC
Operating Temperature	-40°C~+85°C
Working Voltage	DC 5V
Connection	LCC + LGA (487 pins, with a pitch of 1 mm for the stamp-hole pins, individual pin dimensions: 0.7 × 0.6 mm; ball pitch for the LGA is 1.27 mm, with a single ball diameter of 0.8 mm)

■ SoM Function Parameters:

Function	Maximum Number	Parameter	UP4 defines the number of interface resources	Parameter
Parallel CSI	≤1	Supports 8/10/12/16-bit widths, ITU-R BT.656 up to 4_720P@30fps, and ITU-R BT.1120 up to 4_1080P@30fps.	/	
MIPI CSI	≤4	8M@30fps RAW12 2F-WDR, up to 3264(H) x 2448(V), supporting 4+4-lane, 4+2+2-lane, or 2+2+2+2-lane	4	8M@30fps RAW12 2F-WDR, up to 3264(H) x 2448(V), supporting 4+4-lane, 4+2+2-lane, or 2+2+2+2-lane
MIPI DSI	≤1	Supports 4-lane MIPI DSI, 1920x1200@60fps	1	Supports 4-lane MIPI DSI, 1920x1200@60fps
RGB LCD	≤1	DE/SYNC mode, 1920x1200@60fps	/	
LVDS	≤2	Supports dual link 1920 x 1080@60fps, single link 1366 x	1	Supports dual link 1920 x 1080@60fps, single link 1366 x

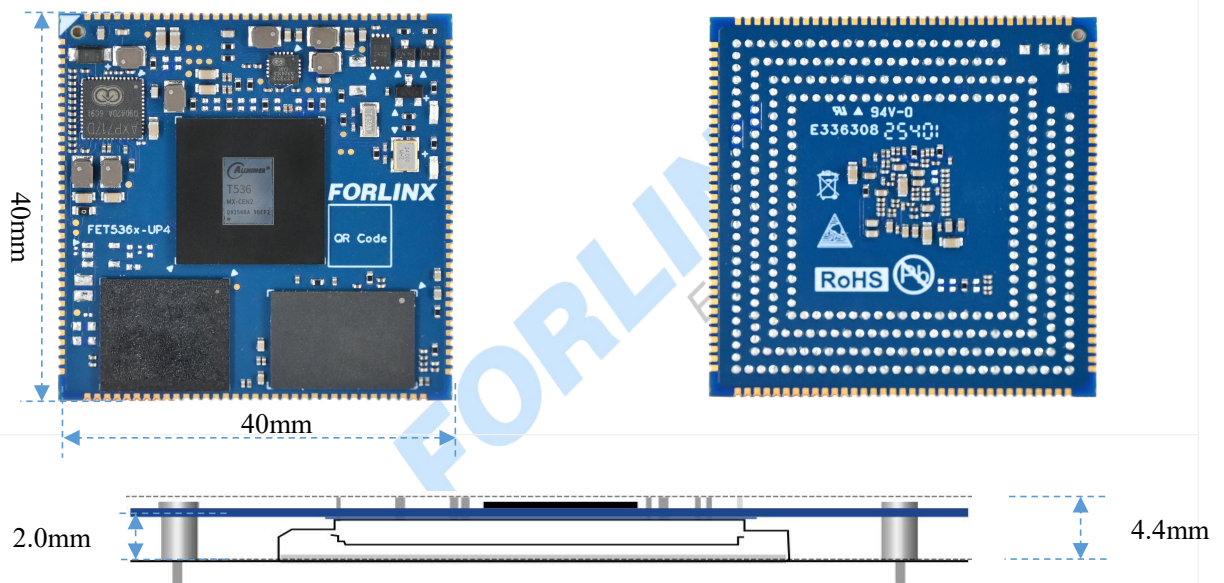
		768@60fps;		768@60fps;
SDIO	≤2	SMHC0 for SD, SMHC1 for SDIO interface, 1.8 V mode only	2	SMHC0 for SD, SMHC1 for SDIO interface, 1.8 V mode only
Audio	≤1	Built-in audio codec supports 1 x differential LINEOUT output	1	Built-in audio codec supports 1 x differential LINEOUT output
I2S	≤4	Supports master/slave mode with sampling rate from 8kHz to 384kHz	1	Supports master/slave mode with sampling rate from 8kHz to 384kHz
DMIC	≤1	Supports 8-channel with sampling rate from 8kHz to 48kHz	/	
OWA IN/OUT	≤1	Single line audio	/	
USB3.1	≤1	USB3.1 OTG, 5Gbps	1	USB3.1 OTG, 5Gbps
PCIe2.1	≤1	Supports RC and EP, 1-lane, 5Gbps	/	
USB2.0 DRD	1	Supports master and slave and High-Speed, 480Mbps	/	
USB2.0 HOST	1	Only supports master mode, and High-Speed, 480Mbps	1	Only supports master mode, and High-Speed, 480Mbps
GMAC	≤2	Support RMII/RGMII interface and rate 10/100/1000 Mbit/s	2	Support RMII/RGMII interface and rate 10/100/1000 Mbit/s
CAN-FD	≤4	Supports CAN-FD and CAN2.0B	2	Supports CAN-FD and CAN2.0B
Local Bus	≤1	Supports 8/16/32 bit width, up to 100MHz bus clock		
SPI	≤5	Supports master/slave mode, up to 100MHz clock	2	Supports master/slave mode, up to 100MHz clock
TWI	≤8	Compatible with I2C standard, standard mode 100 kbit/s, fast mode 400 kbit/s	3	Standard mode 100 kbit/s, fast mode 400 kbit/s
UART	≤17	Compatible with industry standard 16450/16550.	3	Compatible with industry standard 16450/16550.
GPADC	≤28	12-bit sampling resolution and 10-bit accuracy, maximum sampling rate 2MHz	3	12-bit sampling resolution and 10-bit accuracy, maximum sampling rate 2MHz
LRADC	1	6-bit sampling resolution, 2KHz sampling rate, used for key detection	1	6-bit sampling resolution, 2KHz sampling rate, used for key detection
TPADC	≤1	4-wire resistive touch, 12 bit SAR type AD conversion	/	
PWM	≤34	Output frequency 0~24MHz or 0~100MHz	4	Output frequency 0~24MHz or 0~100MHz

LEDC	≤ 1	Control LED light, programmable output high and low width, data up to 800kbit/s	/	
IR TX	≤ 1	Infrared output	/	
IR RX	≤ 5	Infrared receiving	/	

Note:

- The maximum number of parameters in the table is the theoretical value of hardware design or CPU;
- The number of interface resources defined by UP4 in the table is the maximum number supported by the UP4 universal package.

■ Appearance & Dimension :



Height after installation

* Note: The dimensional tolerance is $\pm 0.2\text{mm}$;

* FET536-UP4 SoM. The FET536-UP4 SoM uses the master control model T536MX-CXX.

The FET536E-UP4 SoM uses the master control model T536MX-CEX.

The FET536N-UP4 SoM uses the master control model T536MX-CEN2.

■ Software Support:

OS	Linux 5.10+Qt 5.15
Flashing	•TF card •USB OTG Flashing

■ Peripheral Support List:

Linux 5.10	SDIO	Wi-Fi	AW-UP4M358
	UART	Bluetooth	
	I2C	RTC	PCF8563
	I2C	Touch	FT3427, ft5x06, 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
LVDS	10.1-inch capacitive touch screen	Resolution 1280 × 800, touch chip GT928
MIPI-UP4SI	Camera	OV5645, OV13855
USB	4G	EC20
UART	General	
CAN	General	
PWM	General	LCD Backlight, Buzzer
ADC	General	

■ Product Materials:

Linux 5.10 Materials List:	Software manual, Linux quick start guide, image flashing (or firmware burning) instructions, kernel source code, test program source code, file system, driver tools, download tools, programming (or flashing) tools, development environment, application notes*.
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:

No.	Configuration n Abbreviation	Operating Temperature	CPU Clock	CPU	RA M	ROM	Supply
FET536- UP4+161GSE8GIxx:xx	Industrial- grade	- 40°C~+85°C	1.6GHz	A55	1GB	8GB	Mass Production
FET536N- UP4+162GSE16GIxx:xx	Industrial- grade	- 40°C~+85°C	1.6GHz	A55	2GB	16GB	Mass Production

■ SoM Naming Rules:

A	B	C	-	D	+	E	F	G	H	I	J	K	:	L	M
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This table describes SoM number terms to define its characteristics (e.g., CPU, frequency, temperature grade, version).

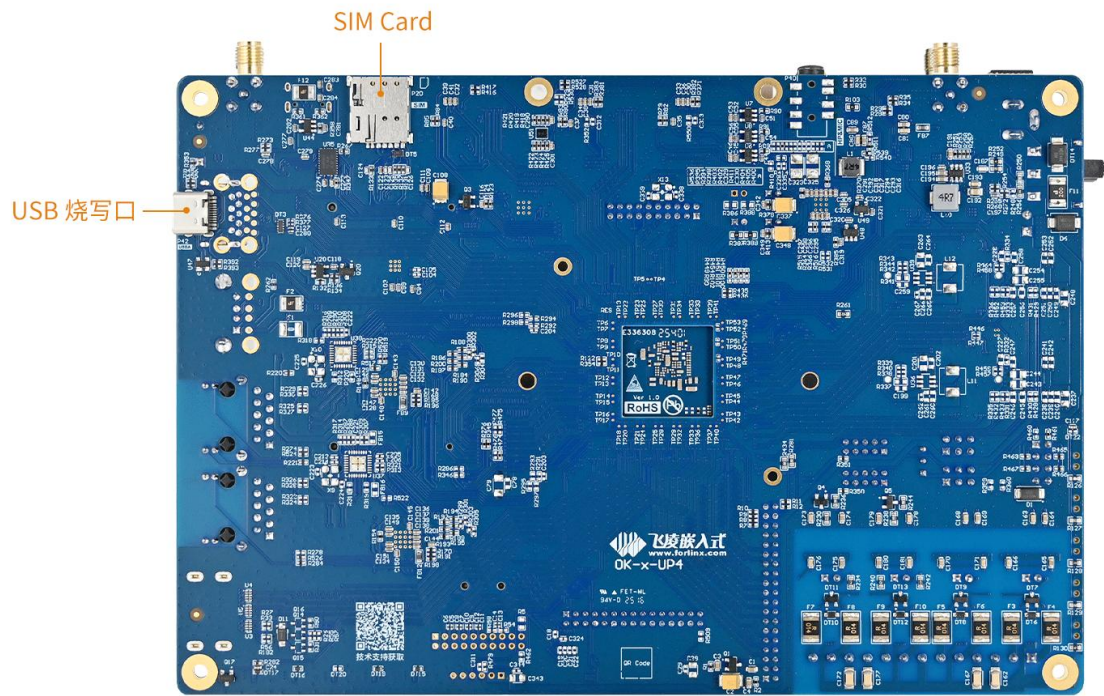
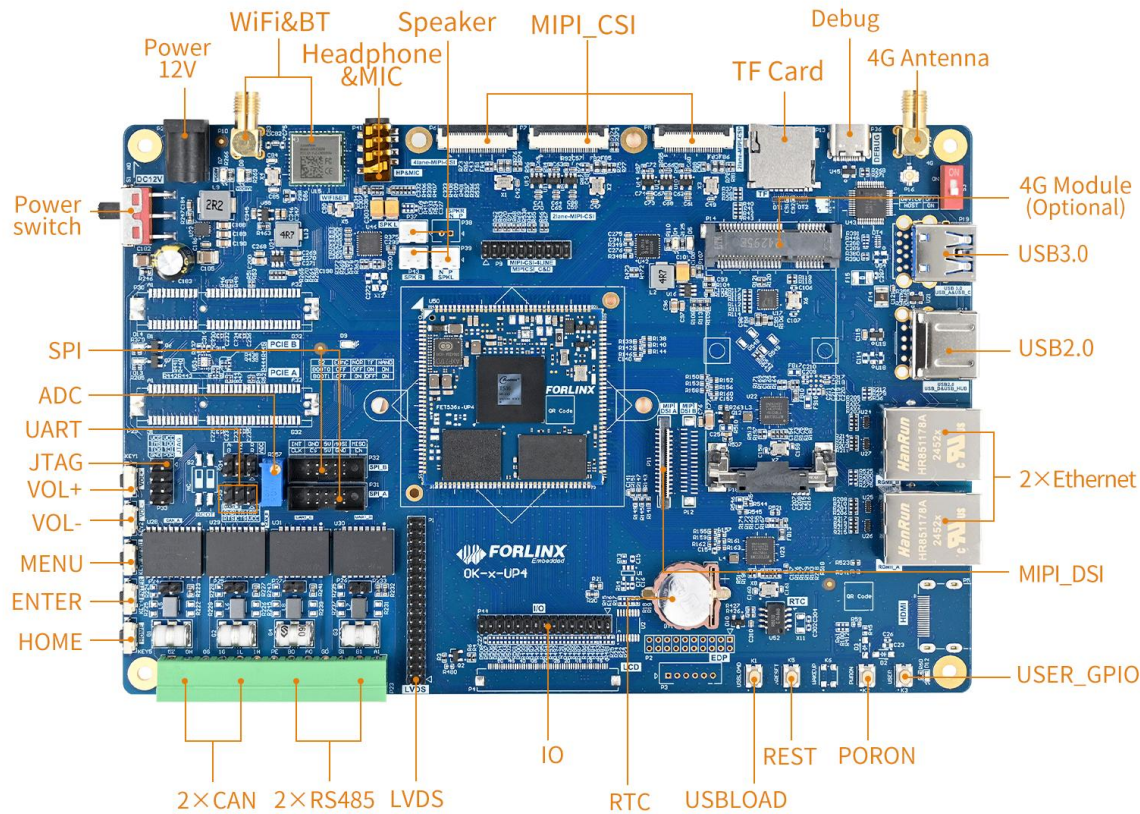
Field	Field Description	Value	Description
A	Qualification level	PC	Prototype Sample
		Blank	Mass Production
B	Product line identification	FET	Forlinx Embedded SoM
C	CPU Name	T536	T536MX-CXX
		T536E	T536MX-CEX

		T536N	T536MX-CEN2
-	Segment Identification	-	
D	Connection	UP4	LCC+LGA general package dimension 40mm×40mm
+	Segment Identification	+	The configuration parameter section follows this identifier.
E	CPU Clock	16	1.6GHz
F	RAM Capacity	1G	1GB
		2G	2GB
	(Unite: Byte)	4G	4GB
G	Single ROM Type	SN	Nand Flash
		SE	eMMC
H	Single ROM Capacity	8G	8GB
		16G	16GB
	(Unite: Byte)	32G	32GB
I	Operating Temperature	E	-25 to 85°C
		I	-40 to 85°C Industrial-grade
J	Configuration No.	A~Z	If the E ~ I field values of each product are the same, the field values are the same, in ascending order according to the configuration release time
K	PCB Version	10	V1.0
		xx	Vx.x
:LM	Internal Identification of the Manufacturer	: xx	This is the internal identification of the manufacturer and has no impact on the use.

■ T536 series SoCs:

Features	T536MX-CEN3	T536MX-CEN2	T536MX-CEX	T536MX-CXX
NPU	Up to 3 TOPS	Up to 2 TOPS	/	/
ECC Protection	Support	Support	Support	/
Forlinx		FET536N-UP4	FET536E-UP4	FET536-UP4

■ Development Board:



■ Development Board Function Parameters:

Function	Quantity	Parameter
WiFi	1	Single antenna 2.4G & 5GHz Wi-Fi Dual-band 1X1 802.11ac +Bluetooth 4.2
Bluetooth	1	
Audio	1	Mono speaker connector, class-D, 1.3 W; Stereo headphone output, 32 Ohm load; Headphone recording + on-board MIC recording
MIPI-CSI	3	FPC socket is led out, 4lane + 2lane + 2lane, of which 4lane can be connected to 4-to-4 analog camera module
TF Card	1	Support maximum SDR104 rate
4G	1	4G module supporting miniPCIE interface, with USB2.0 communication signal
UART Debug	1	Integrated in a Type-C port that can be connected to a computer for debugging
USB3.0	1	USB _ A can switch the master-slave mode and perform USB programming, while USB _ C only supports the master mode.
USB2.0	1	1 x USB-D native USB2.0 and 1 x USB-HUB are led out
Ethernet	2	2 x Gigabit ports led out via a standard RJ45 socket
MIPI-DSI	1	4-lane MIPI-DSI, supports capacitive touch screen and backlight brightness adjustment. The maximum resolution of a single channel is 1920x1200@60fps.
RTC	1	On-board CR1220 battery, keep going when power is off
LVDS	1	4-lane LVDS, supporting capacitive touch screen and backlight brightness adjustment, up to 1366 x 768@ 60fps
RS485	2	Electrical isolation
CAN	2	Supports CAN2.0B, electrical isolation
ADC	3	The pin header pin-out functions, which can be connected to a sliding rheostat to collect voltage values.
SPI	2	Two SPI interfaces, which are led out from the simple bull seat and can be connected to the peripheral debugging function.
UART	1	5 x UART, led out through pin headers.
JTAG	1	JTAG, led out through pin
KEY ADC	5	5 keys are led out via 1 x LRADC

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

■ Power Consumption:

No.	Test Item	SoM Power	Development board power (including SoM)
1	No-load starting peak power consumption	4.485 W	5.196W
2	Sleep power consumption	0.0675 W	0.696W
3	No-load standby power consumption	1.375 W	2.244W
4	USB read and write power	1.555 W	2.964W
5	TF read and write power	2.05 W	2.892W
6	4G module PING network power consumption	1.5 W	3.204W
7	WiFi module PING network power consumption	1.48 W	2.28W
8	10-inch LVDS screen power consumption	1.58 W	6.192W
9	7-inch MIPI screen power consumption	1.46 W	4.452W
10	CPU pressure + memory pressure + eMMC	5.05 W	5.976W

