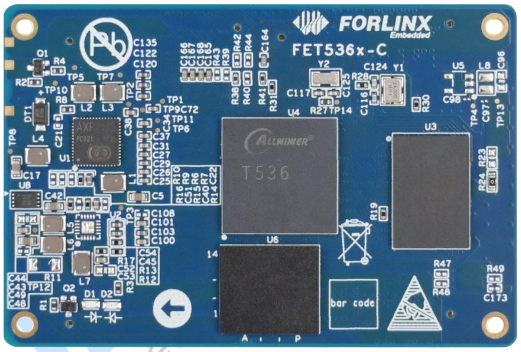
FET536-C SoM

FET536x-C series SoM is developed and designed based on the Allwinner T536 industrial-grade processor . T536 has a clock of 1.6GHz, integrating 1 x quad-core Cortex-A55 and 1 x 64-bit XuanTie E907 RISC-V MCU, providing efficient computing power. It supports 2TOPSNPU, secure boot, national cryptographic algorithm IP, full-path ECC, AMP, Linux-RT, etc. It also features a wide range of connection interfaces, including USB, SDIO, UART, SPI, CAN-FD, Ethernet, ADC, LocalBus, etc. Besides the cost - effective processor, the whole SoM uses industrial - grade components, a great option for cost - reduction in critical fields like concentrators, FTU, DTU, charging stations, transportation, robotics, and industrial control.



ARM+RISC-V Multi-Core Heterogeneous Architecture	4×1.6GHz Main Frequency	2TOPS NPU
Industrial Grade -40 ℃ ~ + 85 ℃	LocalBus Parallel Bus	600 MHz RISC-V

Product Features:

- 2TOPS NPU and ECC
- 4 x CAN-FD and 17 x UART
- Options of 1GB/2GB
- ARM + RISC-V multi-core heterogeneous architecture
- High-speed parallel bus LocalBus

SoM Basic Parameters

Processor	**Allwinner T536** **CPU：** 4×Cortex-A55 **NPU：** 2TOPS **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 LPDDR4
ROM	8GB/16GB eMMC
Operating Temperature	-40℃~+85℃
Working Voltage	DC 5V
Interface	Board-to-board connector (4×80Pin), pin pitch: 0.5 mm, mating height: 2.0 mm)

SoM Function Parameters

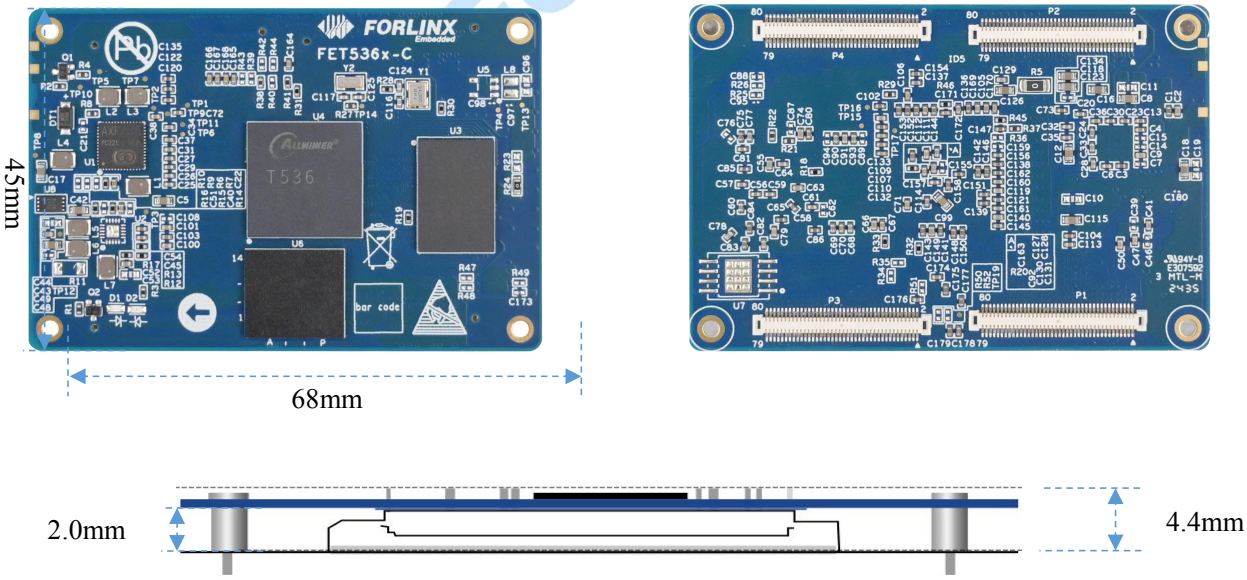
Function	Quantity	Parameter
Parallel CSI	≤1	Supports 8/10/12/16 bit width Supports ITU- BT.656 up to 4* 720P@30fps Supports ITU- BT.1120 up to 4* 1080P@30fps
MIPI CSI	≤4	8M@30fps RAW12 2F-WDR, maximum size 3264(H) x 2448(V) Supports 4+4-lane, 4+2+2-lane, or 2+2+2+2-lane
MIPI DSI(1)	≤1	Supports 4-lane MIPI DSI，1920x1200@60fps
RGB LCD(1)	≤1	DE/SYNC mode，1920x1200@60fps
LVDS(1)	≤2	Supports dual link 1920 x 1080@60fps，single link 1366 x 768@60fps
SDIO	≤2	SMHC0，used for SD card SMHC1，used for SDIO interface, only supports 1.8V model
Audio	≤1	Built-in audio codec supports 1 x differential LINEOUT output
I2S	≤4	Supports master/slave mode with sampling rate from 8kHz to 384kHz
DMIC	≤1	Supports 8 channels with sampling rates from 8kHz to 48kHz
OWA IN/OUT	≤1	Single line audio
USB3.1(2)	≤1	USB3.1 OTG，5Gbps
PCIe2.1(2)	≤1	Supports RC & EP，1-lane，5Gbps
USB2.0 DRD	1	Supports master-slave, high-speed, 480Mbps
USB2.0 HOST	1	Main mode only, supporting high-speed, 480Mbps
GMAC	≤2	Support RMII/RGMII interface, support rate 10/100/1000 Mbit/s
CAN-FD	≤4	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
TWI(3)	≤8	Compatible with I2C standard, standard mode 100 kbit/s, fast mode 400 kbit/s
UART(4)	≤17	Compatible with 16450/16550
GPADC	≤28	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
TPADC	≤1	4-wire resistive touch, 12 bit SAR type AD conversion
PWM	≤34	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 intput
GPIO	≤196	

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

1. **RGB, LVDS, MIPI-DSI are multiplexed. Please read the chip data sheet or the pin multiplexing table;**
2. **USB3.1 and PCIe interfaces are multiplexed, and only one of them can be used at a time;**
3. **S-TWI0 is occupied by the SoM, and the carrier board cannot be used at a time;**
4. **UART0 is used to debug the serial port. It is recommended that the user keep the design.**

Appearance and Dimensions



Schematic Diagram of Height After Installation

*** Note: Dimensional tolerance ± 0.2mm.**

Software Support

OS	Linux 5.10.198+Qt 5.15.8
Flashing Method	• TF card • USB OTG flashing

Peripherals

Linux 5.10	**Interface**	**Function**	**Plan**
	SDIO	Wi-Fi	AW-CM358
	UART	Bluetooth	
	I2C	RTC	PCF8563
	I2C	Touch	FT3427, ft5x06, GT928

	MIPI-DSI	7" Capacitive Touch Screen	Resolution 1024 × 600, touch chip FT3427
	LCD	7" Capacitive Touch Screen	Resolution 1024 × 600, touch chip ft5x06
	LVDS	10.1" Capacitive Touch Screen	Resolution 1280 × 800, touch chip GT928
	MIPI-CSI	Camera	OV5645（No autofocus, 500 W pixels）
	USB	4G	EC20
	UART	General	
	CAN	General	
	PWM	General	LCD Backlight、Buzzer
	ADC	General	

Product Materials

Linux 5.10 Documentation List	Software Manual Linux Quick Start Guide Flashing Image Kernel Source Code Test Program Source Code File System Driver Tools Download Tools Flashing Tools Development Environment Application Notes*
Hardware Materials List	Hardware Manual Pin Multiplexing Comparison Table Pin Function Comparison Table SoM STEP File SoM DXF File Carrier Board DXF File Carrier Board PDF Schematic Diagram Carrier Board Schematic Diagram Source File Carrier Board PCB Source File Carrier Board Design Data Manual

*A wealth of documentation will be provided gradually after the product is released.

Order Model List

Materials No.	Configuration	Operating Temperature	CPU clock	CPU	RAM	ROM	Supply
FET536-C+161GSE8GIxx:xx	Industrial-grade	-40℃~+85℃	1.6 GHz	A55	1GB	8GB	Mass Production
FET536-C+162GSE16GIxx:xx	Industrial-grade	-40℃~+85℃	1.6 GHz	A55	2GB	16GB	Mass Production
FET536N-C+162GSE16GIxx:xx	Industrial-grade	-40℃~+85℃	1.6 GHz	A55	2GB	16GB	Mass Production

SoM Naming Rules

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

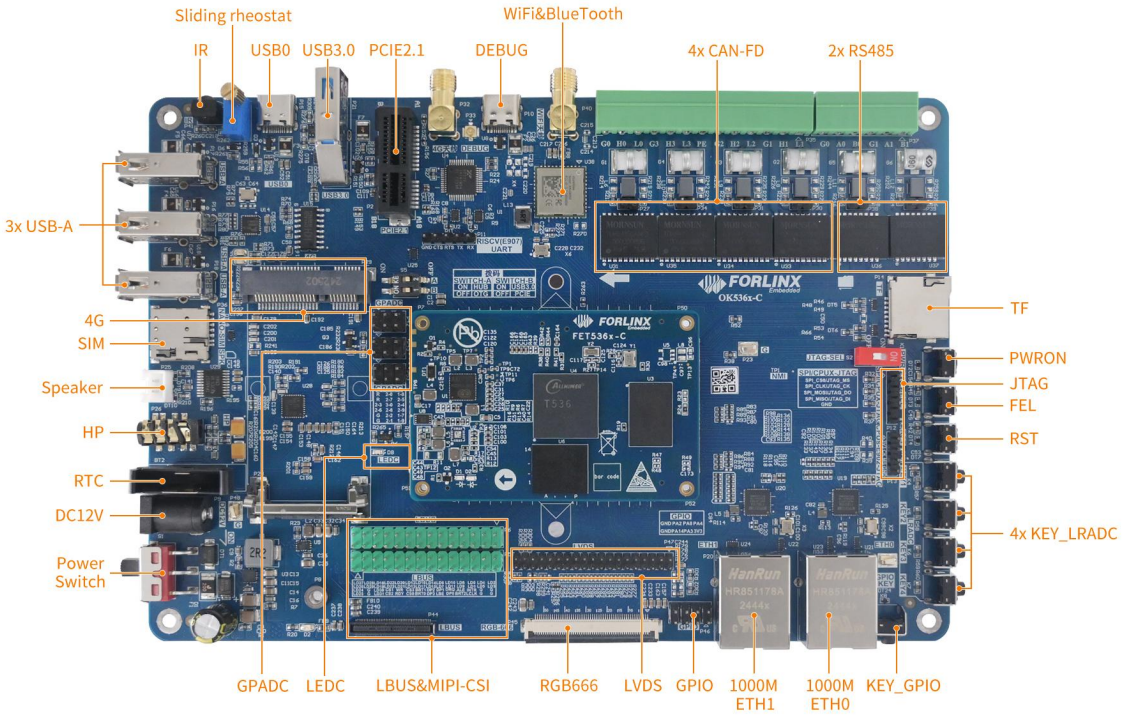
This table describes the terminology used for SoM numbering to identify the features of the SoM (such as CPU, frequency, temperature grade, version, etc.).

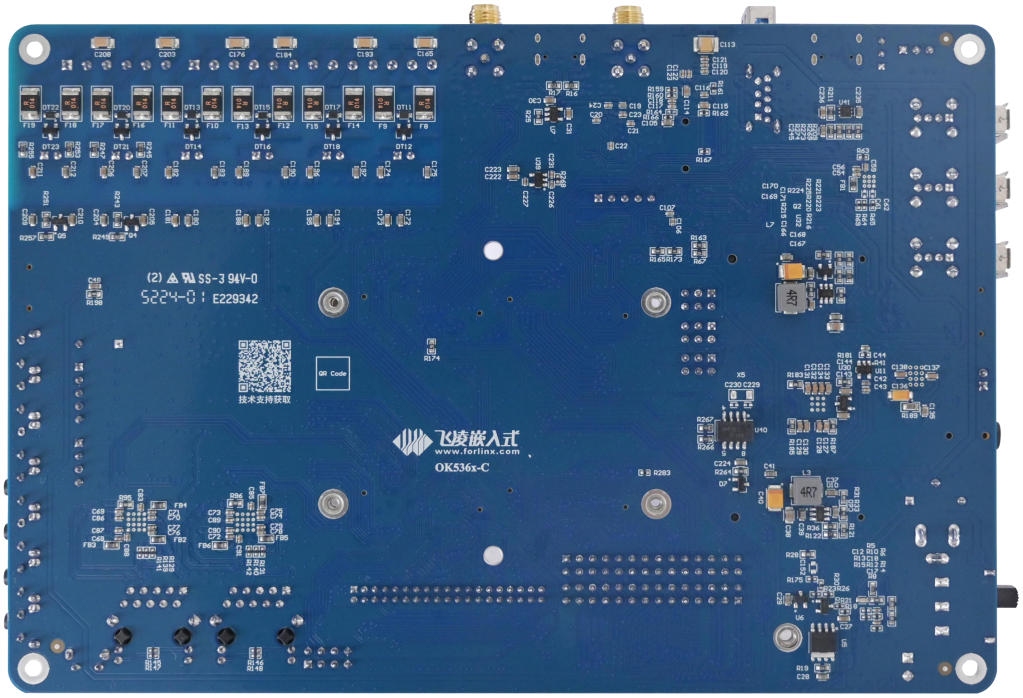
Field	Field Description	Value	Description
A	Acceptance Level	PC	Prototype Sample
		Empty	Mass Production
B	Product line identification	FET	Folinx Embedded SoM
C	CPU	T536	T536MX-CXX
		T536E	T536MX-CEX
		T536N	T536MX-CEN2
-	Segment identification	-	
D	Connection	C	Connector
+	Segment identification	+	This identifier is followed by the configuration parameter.
E	CPU clock	16	1.6 GHz
F	RAM Capacity	1G	1GB
	(Unit: Byte)	2G	2GB
G	Single ROM Type	SN	Nand Flash
		SE	eMMC
H	Single ROM Capacity	8G	8GB
	(Unit: Byte)	16G	16GB
I	Operating Temperature	E	-25 to 85 ℃ Wide Temperature Range
		I	-40 to 85°C Industrial Grade
J	Configuration No.	A~Z	If E- I field values are identical across products, they are treated the same and sorted by release time in ascending order.
K	PCB Version	10	V1.0
		xx	Vx.x
:LM	Manufacturer's Internal Logo	:xx	It is manufacturer's internal logo without influence on use.

T536 Series SoC Models

Features	T536MX-CEN3	T536MX-CEN2	T536MX-CEX	T536MX-CXX
NPU	Up to 3 TOPS	Up to 2 TOPS	/	/
ECC Protection	Support	Support	Support	/
Qualification Level	Industrial	Industrial	Industrial	Industrial

Development Board





Function Parameters

Function	Quantity	Parameter
LCD(1)	1	RGB 666 18-bit, SoM supports up to RGB888 24-bit, 1080p @ 60fps
LVDS(1)	1	Dual Octal with 1080p @ 60fps
MIPI DSI(1)	1	LVDS to MIPI to board, supporting 4lane and 1080p @ 60fps;
Ethernet	2	10/100/1000Mbps adaptive， RJ-45 interface
TYPE-C （DEBUG）	1	Convert debugging UART to USB export, debug CPUS, CPUX and RISC-V respectively
TYPE-C （USB0）(2)	1	Native USB0 interface supports OTG multiplexed with the USB hub, allowing only one to be used at a time.
USB Host(2)	3	Expanded by hub, USB 2.0 (supporting up to 480 Mbps), multiplexing with native USB0, only one to be used at a time.
USB3.0(3)	1	Led out by USB3.0-A socket, multiplexing with PCIE pin, only one to be used at a time.
PCIE2.1(3)	1	Led out by PCIE X1 socket, multiplexing with USB3.0 pin, only one to be used at a time.
TF	1	Supports SD3.0
MIPI CSI	3	Multiplexed with Local Bus. External FIT - CAM_E module board needed, with 1 x 4Lane MCSI and 2 x 2Lane MCSI.
WiFi&BlueTooth	1	On-board AW-CM358SM, 2.4G/5G dual-band Wi-Fi, BT5.0, and audio. The Wi-Fi function occupies 1 x SDIO interface. The BT function occupies 1 x UART interface. The audio occupies 1 x I2S
PWM	1	Connected to the LCD backlight adjustment
GPADC	14	1.8V, with a sliding potentiometer on carrier board for convenient testing.
RTC	1	On-board CR2032 battery, power-off keep time
Audio	2	1 x four - section headphone jack, with a built - in HP (headphone) and MIC (microphone). 1 x mono SPEAKER connector
KEY	8	Includes reset, flashing, switch, GPIO key, LRADC key X4
CAN-FD	4	CAN-FD with protection circuit
485	2	With automatic send/receive control with protection circuitry
IR	1	IR_RX, sample rate 1MHz, 64*8bits cache
Local Bus	1	Led out via a 90 - pin connector, 8/16/32 - bit width data transmission, synchronous read/write 128X8 FIFO. Also led out via 2.54 - mm pin headers. Multiplex with MIPI - CSI, and only one to be used at a time.
4G(2)	1	Extended by USB2.0 hub multiplexed with USB0
GPIO	5	Pinout
LEDC	1	Independent controllable light
CPUX-JTAG	1	Pinout
CPUS-E902-JTAG	1	Pinout

RISC-V (E907) UART	1	Pinout

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

1. **The interfaces of LCD, MIPI - DSI, and LVDS are multiplexed, and only one of them to be used at a time;**
2. **TYPE - C (USB0) and the USB hub are multiplexed. A DIP switch is required to choose one of them;**
3. **USB3.0 and PCIE2.1 are multiplexed. A DIP switch is required to choose one of them.**

