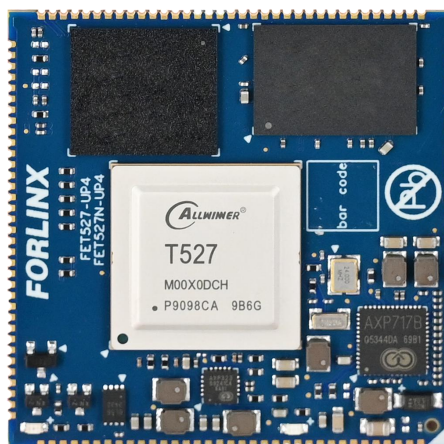


FET527N-UP4 SoM

FET527N-UP4 SoM is based on the Allwinner T527 series high-performance processor. It integrates eight Arm Cortex-A55 cores, along with one RISC-V core and one HiFi4 DSP core. With a 2 TOPS NPU, it delivers the AI acceleration your applications need. Validated through rigorous industrial-environment testing by the Forlinx Embedded Laboratory, it helps ensure long-term product stability. A 10–15 year longevity provides reliable long-term supply for your product.

Product Features:

- Five Display Interfaces: MIPI DSI, RGB, LVDS, eDP, and HDMI, supporting dual-screen heterogeneous display;
- Rich Bus Interfaces: PCIe 2.1, USB 3.1, CAN, and more;
- High-definition hardware decoding, supporting 4K resolution;
- 2 TOPS NPU;
- LCC+LGA package (compact size);
- Universal package and is compatible with the UP4 series of SoMs.



8×Cortex-A55 Architecture	1.8 GHz Clock	UP4 package Compatibility
ARM G57 MC1 GPU	2TOPS NPU	H.265@4Kp60 Hardware High-Definition Decoding

SoM Parameter:

Processor	Allwinner T527N ARM: 4×Cortex-A55@1.8GHz + 4×Cortex-A55@1.4GHz RISC-V: 200MHz DSP: 600MHz HiFi4 NPU: 2 TOPS, supporting INT8/INT16 precision, and 40 operators (including Conv, Activation, Pooling, etc.) and custom operators. GPU: ARM G57 MC1 VPU: Hardware Encoding: H.264; 4K@25fps Hardware Decoding: H.265, 4K@60fps; H.264; 4K@30fps
RAM	2GB/4GB LPDDR4

ROM	16GB/32GB eMMC
Operating Temperature	Industrial level: -40°C~+85°C, Temperature range: -25°C ~ +85°C
Operating Voltage	DC 5V
Interface	LCC + LGA (487 pins, pin center pitch of stamp hole is 1mm, single pin size: 0.7 * 0.6mm, ball pitch of LGA is 1.27 mm, single ball diameter is 0.8mm)

■ SoM Parameter:

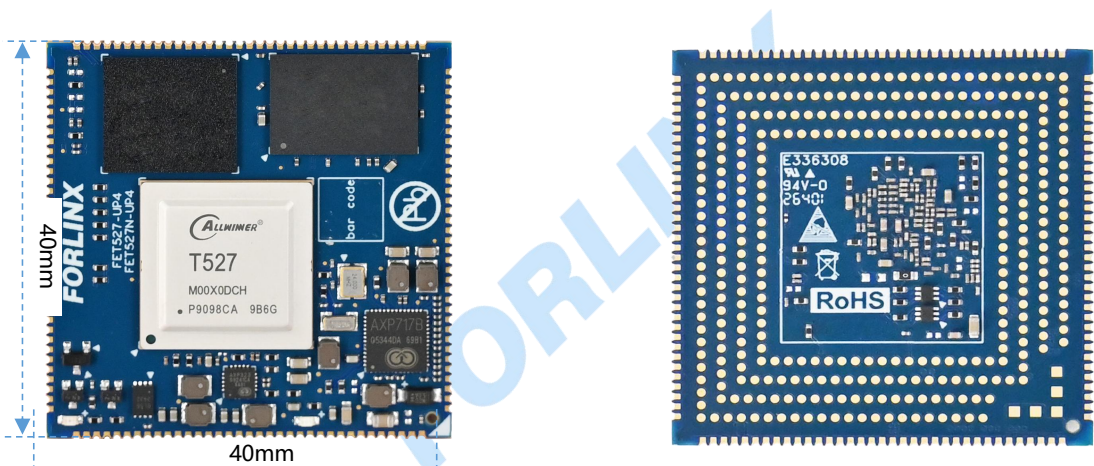
Function	Maximum Number	Parameter	UP4 defines the number of interface resources	Parameter
Parallel CSI	1	Supports 8/10/12/16-bit widths; ITU-R BT.656 up to 4*720P@30fps, and ITU-R BT.1120 up to 4*1080P@30fps	/	
MIPI CSI	≤4	8M@30fps RAW12 2F-WDR, maximum size 3264(H) x 2448(V), supported lane configurations 4+4-lane, 4+2+2-lane, or 2+2+2+2-lane	3	8M@30fps RAW12 2F-WDR, maximum size 3264(H) x 2448(V), supported lane configurations 4+2+2-lane
MIPI DSI	≤2	Supports 4-lane MIPI DSI, 1280 x 720@60fps and 1920 x 1200@60fps; Supports 4+4-lane MIPI DSI, 2560x1600@60fps, 3840x2160@45fps, 4096 x 2160@45fps	1	Supports 4-lane MIPI DSI, 1280 x 720@60fps and 1920 x 1200@60fps
RGB	≤2	TCON_LCD0 supports DE/SYNC mode, 1920 x 1080@60fps; TCON_LCD2 supports DE/SYNC mode, 1280x720@60fps	/	
LVDS	≤2	Supports dual link 1920 x 1080@60fps, single link 1366 x 768@60fps;	1	Supports dual link 1920 x 1080@60fps, single link 1366 x 768@60fps;
eDP1.3	1	Supports 2.5K @ 60 fps and 4K @ 30 fps; Supports audio, maximum sampling rate 192 kHz.	1	Supports 2.5K @ 60 fps and 4K @ 30 fps; Supports audio, maximum sampling rate 192 kHz.
HDMI2.0	1	Supports 2D display at 4K @ 60 fps, 3D display at 4K @ 30 fps; Supports audio, maximum sampling rate 192 kHz.	1	Supports 2D display at 4K @ 60 fps, 3D display at 4K @ 30 fps;

				Supports audio, maximum sampling rate 192 kHz.
Audio Codec	1	One stereo headphone output; two differential LINEOUT outputs; three differential MIC inputs.	1	One stereo headphone output; two differential LINEOUT outputs; one differential MIC input.
I2S/PCM	≤ 4	The sampling rate supports 8kHz to 384kHz.	1	The sampling rate supports 8kHz to 384kHz.
DMIC	1	Supports 8-channel with sampling rate from 8kHz to 48kHz	/	
OWA IN/OUT	1	Single line audio	/	
CAN	≤ 2	The baud rate is up to 1Mbps	2	The baud rate is up to 1Mbps
USB	≤ 3	USB0: USB2.0 OTG, 480Mbps USB1: USB2.0 Host, 480Mbps USB2: USB3.1 OTG, 480Mbps USB3: USB3.1 OTG, 5Gbps	3	1×USB3.0, supporting OTG; 1×USB2.0 supporting OTG; 1×USB2.0HOST
PCIe2.1	1	RC mode only, 1-lane, 5Gbps	/	
SDIO	≤ 2	SDC0: for SD card, up to 200 MHz in SDR mode SDC 1: SDIO 3.0, up to 200 MHz in SDR mode	2	SDC0: for SD card, up to 200 MHz in SDR mode SDC 1: SDIO 3.0, up to 200 MHz in SDR mode
SPI	≤ 4	SPI0: Supports SPI master/slave mode, up to 100 MHz; SPI2: Supports SPI master/slave mode, up to 100 MHz; S_SPI0: Supports SPI master/slave mode, up to 100 MHz; SPI1: Supports SPI mode and DBI mode (Display Bus Interface).	2	SPI2: Supports SPI master/slave mode, up to 100 MHz; SPI1: Supports SPI mode and DBI mode (Display Bus Interface).
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	≤ 10	Compatible with industry standard 16450/16550.	3	Compatible with industry standard 16450/16550.
GMAC	≤ 2	Supports RMII/RGMII interface and rate 10/100/1000 Mbit/s	2	Supports RMII/RGMII interface and rate 10/100/1000 Mbit/s
GPADC	14	12-bit sampling resolution and 10-bit accuracy, maximum sampling rate 1MHz	3	12-bit sampling resolution and 10-bit accuracy, maximum sampling rate 1MHz

LRADC	2	6-bit sampling resolution, 2KHz sampling rate, used for key detection	1	6-bit sampling resolution, 2KHz sampling rate, used for key detection
PWM	≤30	Output frequency 0~24MHz or 0~100MHz	3	Output frequency 0~24MHz or 0~100MHz
CIR TX/RX	1	Infrared signal sending/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:**



* Note: The dimensional tolerance is ±0.2mm..
FET527N-UP4 master control model: T527M02X0DCH
FET527-UP4 master control model: T527M00X0DCH

■ **Software Support:**

OS	Linux 5.15.104 +QT 5.12.5
Flashing	•TF card •USB OTG

■ Peripheral Support List:

Linux 5.15 Drive Support List	Interface	Function	Plan
	SDIO	Wi-Fi	AW-CM358
	UART	Bluetooth	
	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
		7-inch resistive touch screen	Resolution 800 × 480, touch chip tsc2007
	LVDS	10.1-inch capacitive touch screen	Resolution 1280 × 800, touch chip GT928
	PCIe	PCIe to Ethernet	INTEL E1000, 1GbE
	MIPI-CSI	Camera	OV5645 (No autofocus, 500 W pixels)
	MIPI-CSI	Camera	TP2815 (4×AHD to MIPI-CSI)
	RGMII	Ethernet	YT8521 PHY
	USB	USB to UART	XR21V1414
	USB	4G	EC20
	UART	General	
	CAN	General	
	PWM	General	LCD Backlight, Buzzer
	ADC	General	

■ Product Materials:

Linux5.15 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	Temperature	Supply
FET527N-UP4+184GSE32GIxx: xx	8×A55	1.8 GHz	4GB	32GB	-40°C~+85°C	Mass Production
FET527-UP4+182GSE16GIxx: xx	8×A55	1.8 GHz	2GB	16GB	-40°C~+85°C	Mass Production

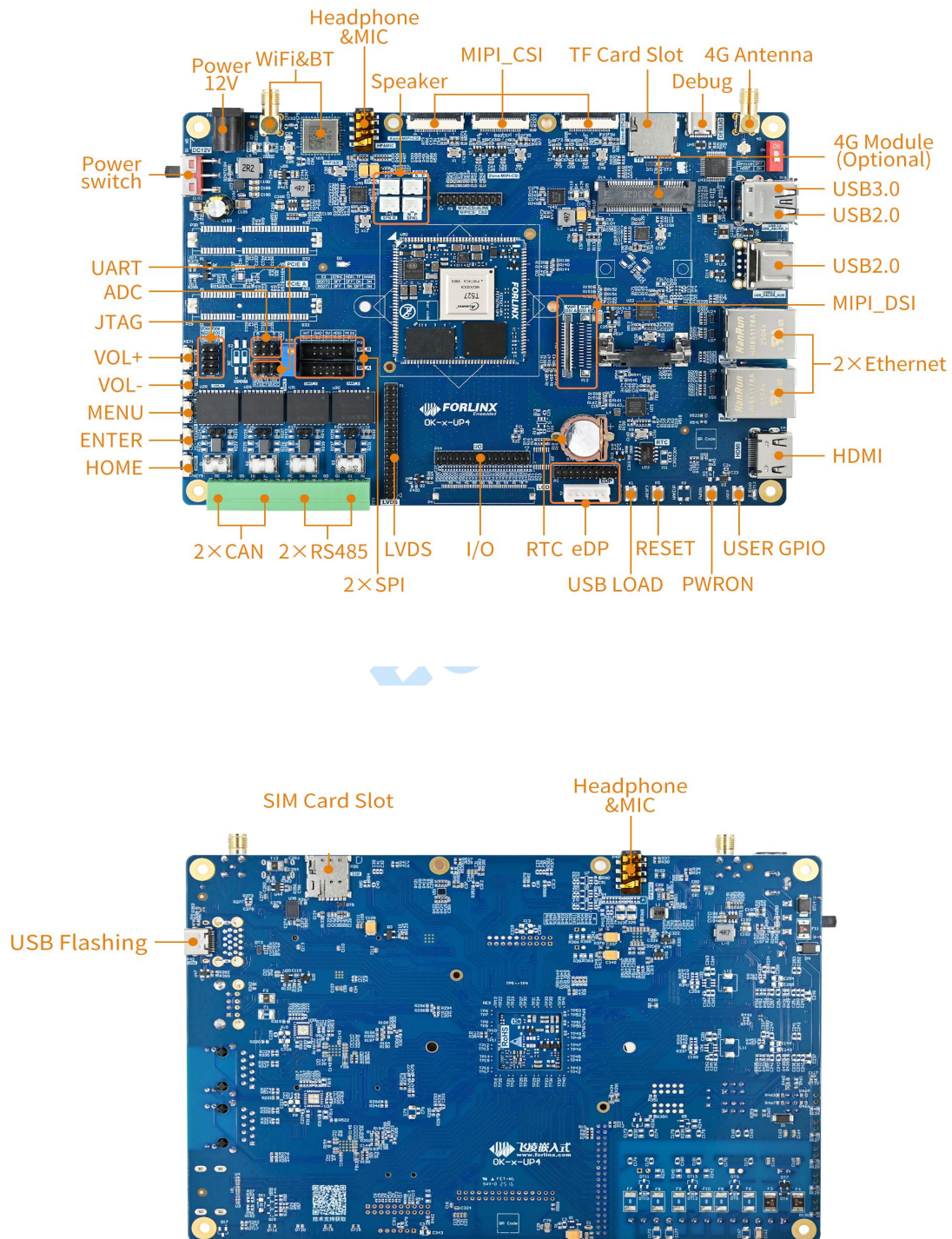
■ SoM Naming Rules:

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 FL	Forlinx Embedded SoM Forlinx Embedded All in One Panel
B	CPU Name	527N 527	T527M02X0DCH, supporting NPU T527M00X0DCH, without NPU
-	Segment Identification	-	
C	Connection	UP4	LCC+LGA general package dimension 40mm×40mm
+	Segment Identification	+	The configuration parameter section follows this identifier.
D	CPU Clock (Max.)	18	1.8 GHz
E	RAM Capacity (Unit: Byte)	1G 2G 4G	1GB 2GB 4GB
F	Single ROM Type	SE	eMMC
G	Single ROM Capacity (Unit: Byte)	8G 16G 32G	8GB 16GB 32GB
H	Operating Temperature	E I	-25 to 85°C -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 11 xx	V1.0 V1.1 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:



■ 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	2	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	Data rate up to SDR104;
4G	1	Supports 4G modules with a miniPCIE interface, integrating USB2.0 communication signals.
UART Debug	1	Integrated into a single Type-C port, enabling connection to a PC 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	2	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
HDMI	1	Supports HDMI 2.1 resolution up to 4096× 2304 @ 60Hz
EDP	1	Supports eDP 1.3 resolution up to 2560× 1600 @ 60Hz
MIPI-DSI	2	4-lane MIPI-DSI, supporting capacitive touch screen and backlight brightness adjustment. The maximum resolution of a single channel is 1920 × 1080@60Hz, and the maximum resolution of dual channels is 2560×1600@60Hz.
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 1280×800@60Hz
RS485	2	Electrical quarantine
CAN	2	Supports CAN2.0B, electrical quarantine
ADC	3	Led out from the pin header and can be connected to the on-board sliding rheostat
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 (W)	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 read/write pressure test power	5.05 W	5.976W