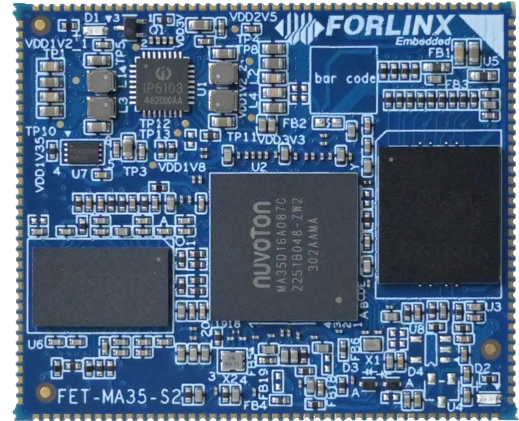


## FET-MA35-S2 SoM

FET-MA35-S2 SoM is developed based on the Nuvoton MA35 series processor, which focuses on the applications such as charging piles, HMI, industrial control, medical equipment, new energy, edge gateways, smart buildings, smart agriculture, and T-Box. MA35 processor utilizes the Armv8-A architecture, featuring a dual-core 64-bit Arm® Cortex-A35 processor running at up to 800 MHz, supporting ultra-high-definition 1080p video and graphical user interfaces. It is equipped with an Arm® Cortex-M4 microcontroller running at 180 MHz, providing real-time processing capabilities for various applications. It has rich peripherals, such as 2 x Gigabit Ethernet, 17 x UART, 4 x CAN-FD, SPI, I2C, and USB 2.0. Various Configurations: 512MB+8GB, 1GB+8GB



### Features:

- Heterogeneous Multi-core Design, A core up to 800MHz, M4 core runs up to 180MH
- Dual Gigabit Ethernet Support
- System security, secure boot, tamper detection, built-in AES, SHA, ECC, RSA, and SM2/3/4 encryption/decryption accelerators
- 4 x native CAN-FD, 17 x UART
- 2D GPU, resolutions up to 1920x1080 @60fps
- Compact size, 260 pins (exposed)

<b>4×A35+M4 Architecture</b>	<b>800 MHz A35</b>	<b>180 MHz M4</b>
<b>CAN-FD 4</b>	<b>UART 17</b>	<b>-40°C~+85°C Temperature Range</b>

### ■ SoM Features

<b>Processor</b>	<b>Nuvoton MA35D16A087C</b> CPU : 2×Cortex-A35@800MHz+Cortex-M4@180MHz GPU: 2D GPU Decoding: AVC/H.264, MVC, SVC : up to 1920 x 1080 @ 45 fps
<b>RAM</b>	512MB/1GB DDR3L
<b>ROM</b>	8GB eMMC
<b>Voltage</b>	5V
<b>Operating Temperature</b>	-40°C~+85°C
<b>Interface</b>	LCC+LGA (260 pins, 1mm pitch, 0.9x0.6mm pins, 1.5mm LGA ball pitch, 1mm ball diameter)

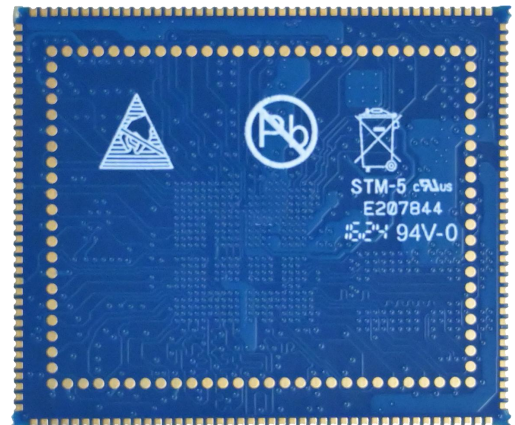
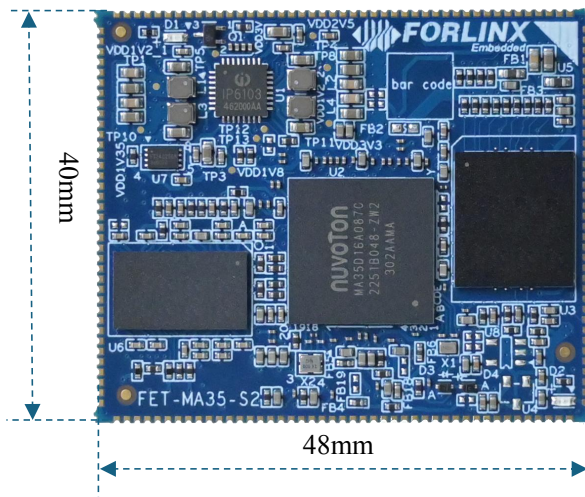
## ■ SoM Features

Function	QTY	Spec.
USB 2.0	2	1 x USB2.0 Host 1 x USB 2.0 OTG
RGB	≤ 1	RGB888, resolution up to 1920*1080
CSI	≤ 2	Supports up to 3m pixels
Ethernet	≤ 2	10/100/1000 Mbit/s Ethernet, RGMII and RMII
UART	≤ 17	Baud rate up to 9.5Mbps
ISO7816	≤ 2	ISO-7816-3
QSPI	≤ 2	Configurable master-slave mode, clock up to 100MHz
SPI	≤ 4	Configurable master-slave mode, clock up to 100MHz
I2S	≤ 2	Configurable master-slave model
I2C	≤ 5	7bits and 10bits address modes up to 1 Mbit/s.
CAN-FD	≤ 4	CAN-FD V1.0 and CAN2.0 A/B ;
EPWM	≤ 18	18-channel EPWM
SDIO	≤ 1	SD0 4-bit, only support 3.3V
ADC	≤ 8	8 x single-ended inputs, 10 bit, 500K SPS, 4-wire or 5-wire touch
EADC	≤ 8	8 x single-ended or 4 x differential input, 10 bit, 4.7 M SPS

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

## ■ Appearance and Dimensions:

**Note:** Tolerance of marked\* dimensions  $\pm 0.2\text{mm}$ .



## ■ Software Support

OS	Linux 5.10.140 +QT 5.12.8
Flashing Method	USB OTG , TF card

## ■ Peripherals

Linux 5.10.140 Driver:	Interface	Function	Plan
	USB	WiFi /Bluetooth Module	SoM On-board BL-M8723DUI
	IIS	Audio	NAU88C22YG
	IIC	RTC chip	rx8010
	LCD	7" Capacitive Touch Screen	
	IIC	Touch gt911	FIT-LCD7.0C V2.1
	USB	USB Camera	RMONCAM FHD 720P UVC Camera
	USB	4G Module (minipcie package)	EC20
	LVDS	Topmicro LCD	8008480

## ■ Product Materials

Linux 5.10.140 Materials List	Manuals, Linux Kernel Source Code, File Systems, Factory Images, Burn Tools
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**Note: Comprehensive materials will be provided after release.**

## ■ Model List:

Specification	Core	CPU Clock	RAM	ROM	Operating Temperature	Supply
FET-MA35-S2+08512SE8GIxx:xx	2×A35	800 MHz	512MB	8GB	-40℃~+85℃	SOP
FET-MA35-S2+081GSE8GIxx:xx	2×A35	800 MHz	1GB	8GB	-40℃~+85℃	SOP

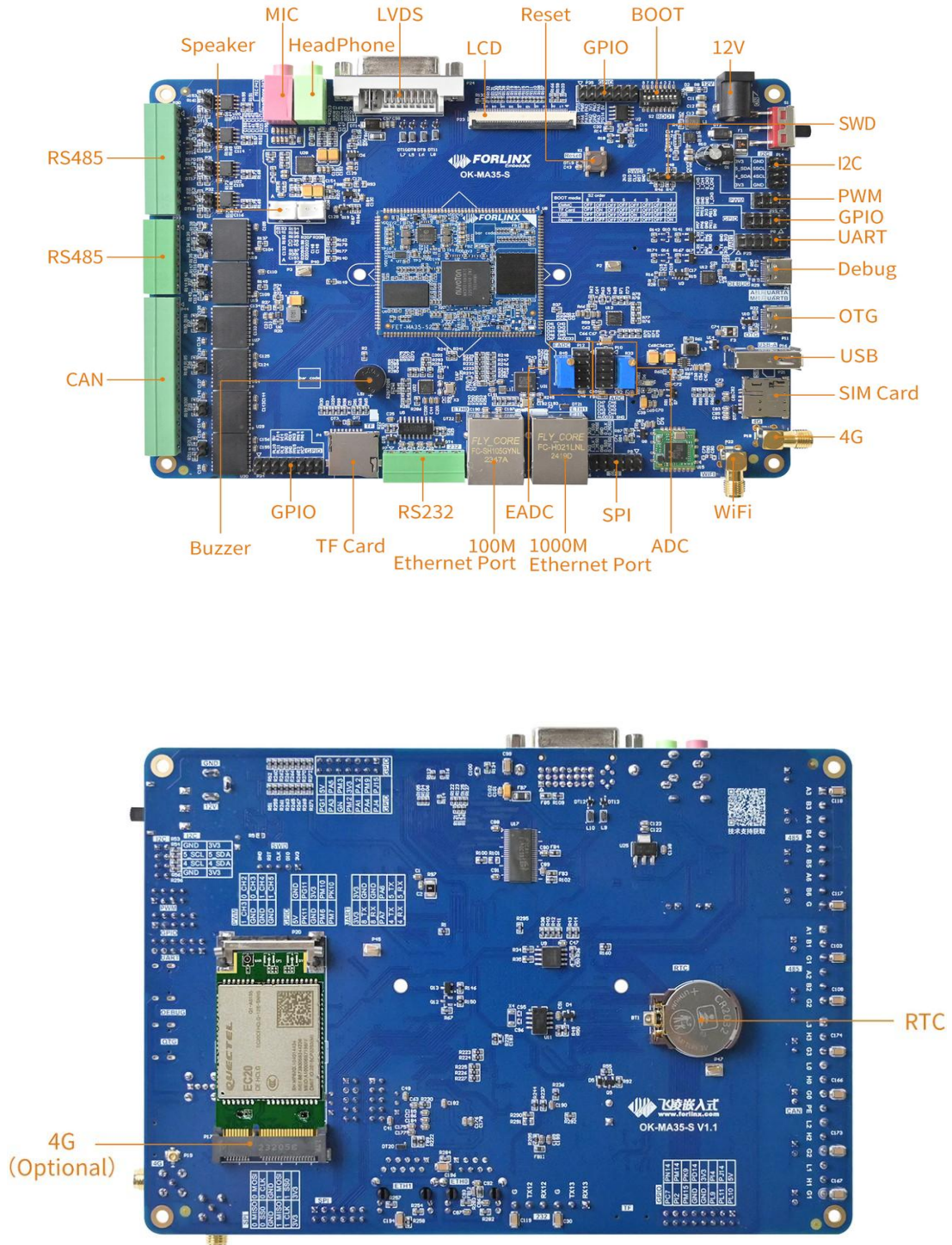
## ■ SoM Naming Rule:

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

Fields Description Table (SoM features can be checked in the table, e.g: CPU, Frequency, Temperature level, Version, etc.)

Field	Field description	Value	Description
A	Product line identification	FET	Folinx Embedded SoM
-	Segment identification	-	
B	CPU	MA35	MA35D16A087C
-	Segment identification	-	
C	Connection	S	Edge Connector
+	Segment identification	+	It is followed by the configuration parameter section.
D	CPU Clock	08	800 MHz
E	RAM Capacity	512	512MB
	(Unit: Byte)	1G	1GB
F	Single ROM Type	SE	eMMC
	Multiple ROM Type	OE	Nor Flash + eMMC
G	Single ROM Capacity	8G	8GB
	(Unit: Byte)	32G	32GB
H	Operating Temperature	I	-40°C to +85°C Industrial Grade
I	Configuration Code	A~Z	If D-H field values are identical across products, they are treated the same and sorted by release time in ascending order.
J	PCB Version	10	V1.0
		11	V1.1
		xx	Vx.x
: KL	Manufacturer's Internal Logo	: xx	It is manufacturer's internal logo without influence on use.

## Development Board



## ■ Function Parameters

Function	Quantity	Parameter
USB 2.0	2	1 x USB HOST, extended from USB Type A socket 1 x USB OTG, extended from USB Type-C socket, only for use as a Device
LCD	1	Supports RGB888 t, resolution up to 1920*1080@ 60fps
LVDS	1	Converted through LCD and extended via DVI-I socket
Ethernet	2	1 x Gigabit, 1 x 100 Megabit, downward adaptive rate, dual RJ45 ports can be used simultaneously
TF Card	1	1 x TF Card slot, compatible with SD3.0
4G	1	Supports 4G module via a mini PCIe interface
WiFi/BT	1	RL-UM02WBS-8723DU-V1.2 Standard: IEEE 802.11b/g/n, BT V2.1/BT V3.0/BT V4.0
Audio	1	Default onboard chip: NAU88C22YG Supports headphone output and MIC input via two 3.5mm TRS jacks Supports 2 x 1W 8Ω speaker output via a white XH2.54 connector
I2C	4	2 x connector for mounting the carrier board LCD touch and audio 2 x connector, each with 2 x 4 Pin 2.54mm spacing header pins, for mounting external devices
PWM	7	2 x connector, for adjusting LCD backlight brightness and BUZZER respectively 5 x connector, each with 2 x 4 Pin 2.54mm spacing header pins, for mounting external devices
RTC	1	On-board independent RTC chip, which can record time via a button battery when the carrier board is powered off
UART	3	2 x 6Pin 2.54mm spacing header pins for mounting external devices
RS485	6	Galvanic isolation, controlled via GPIO for transmit and receive direction
CAN	4	Galvanic isolation, supporting CAN-FD
SPI	2	2 x 6Pin 2.54mm pitch for mounting external devices
QSPI	1	On-board 16MB QSPI NOR FLASH
DEBUG UART	2	A-core UART0 and M-core UART16 converted to USB signals, output via Type-C, default baud rate 115200
ADC	8	8 x single-ended inputs, 10 bit, 500K SPS, 4-wire or 5-wire touch support
EADC	8	8 x single-ended or 4 x differential input, 10 bit, 4.7 M SPS
KEY	1	Reset Button
SWD	1	1x5pin single-row 2.54mm pitch for exporting

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

## ■ Power Consumption:

No.	Test Items	SoM Consumption		Development Board (including SoM) Consumption	
		Power Supply Voltage(V)	Power ( W )	Power Supply Voltage(V)	Power ( W )
1	Peak startup power without load	5	2.21	12	3.7
2	CPU Stress + Memory + eMMC Read/Write Stress Test	5	2.06	12	4.55
3	On-board LVDS + 4G + video encoding	5	2.02	12	5.03
4	On-board LVDS + 4G + video encoding + CPU stress + memory + eMMC read/write stress test	5	2.56	12	5.56

**Note: The parameters in the table are experimental data for reference only.**