# FET-MX91xx-C SoM

FET-MX91xx-C SoM is a new system on module based on NXP i.MX91xx[①] which is a Cortex-A55 featuring single core processor running at speed up to 1.4GHz. 8x UART, 2x Ethernet, 2x USB2.0, 2x CAN-FD and other common interfaces are all available.
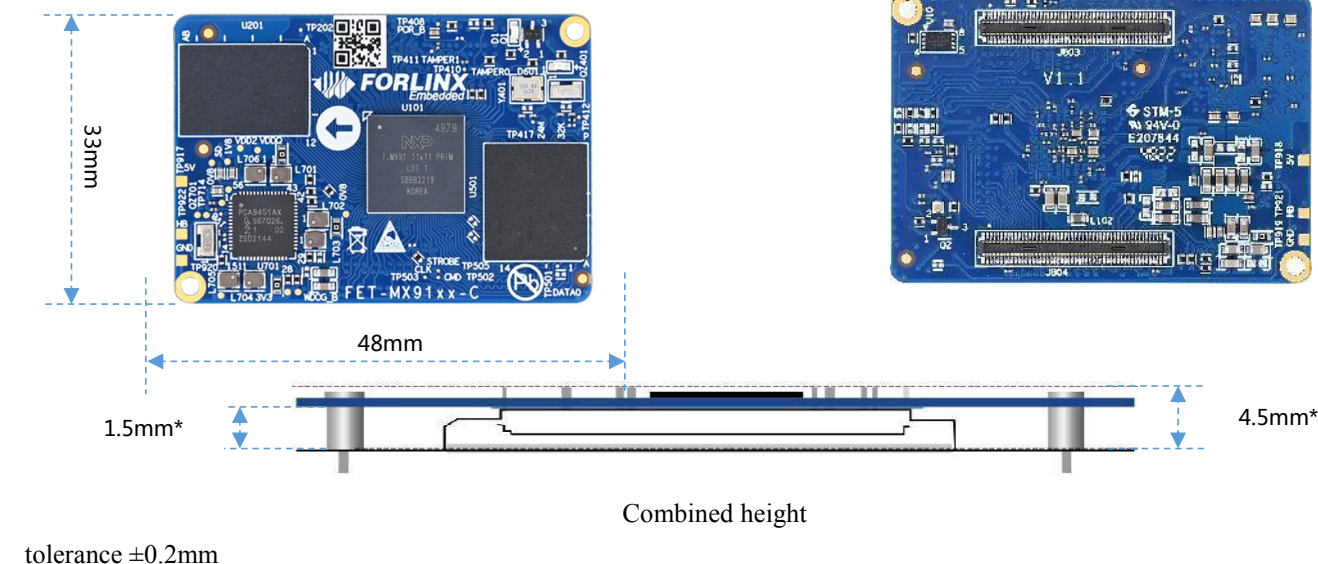
**Features:**

- Cortex-A55 featuring, high energy efficient ;

- High scalability;

- Compact structure, easy for integration;

- Cost-optimized
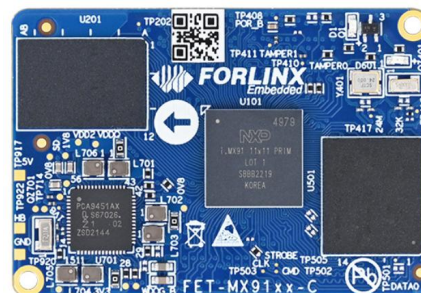


| Cortex-A55 | 1.4GHz | 2x Gigabit |
|:---:|:---:|:---:|
| Architecture | Clock | Ethernet |
| CAN-FD | UART | -40~85℃ |
| 2 | 8 | Operating temp width |

- ## Exterior and dimensions:



33mm

48mm

1.5mm*

4.5mm*

Combined height

tolerance ±0.2mm

■ **SoM features：**

| CPU | **NXP i.MX91XX** <br> **MPU:** 1×Cortex-A55@ 1.4GHz |
|---|---|
| RAM | 1GB LPDDR4 |
| ROM | 8GB eMMC |
| Voltage input | DC 5V |
| Operating temp | -40~ +85℃ |
| Package | Board-to-board connector(2*100-pin, 0.4mm pitch, combined height 1.5mm) |

■ **SoM Peripheral Source:**

| Interface | QTY | Spec. |
|---|---|---|
| LCD | 1 | Parallel RGB888, up to 1366×768p60 or 1280×800p60 |
| Ethernet | ≤2 | 2x RGMII <br> Transmission rate 10/100/1000 Mbps, complies with IEEE 802.3 |
| UART | ≤8 | Baud rate up to 5Mbps <br> Supports serial data transceiver configuration, including programmable parity bit |
| CAN-FD | ≤2 | Supports CAN-FD and CAN 2.0B |
| USB | ≤2 | Two USB2.0 controllers integrated with PHY |
| SD | ≤1 | Complies with SD3.0 <br> Supports SDR up to 200MHz and DDR up to 50MHz |
| SDIO | ≤1 | SDIO3.0 |
| SAI | ≤3 | A Synchronous Audio Interface (SAI) is available <br> SAI1 supports 2 lanes, SAI2 supports 4 lanes, and SAI3 supports 1 lane; <br> Support full-duplex serial with frame synchronization, such as I2S, AC97, TDM and codec/DSP |
| PDM | 1 | 24-bit, supports linear phase response and AOP MIC |
| Camera | 1 | 8-bit parallel camera interface |
| SPI | ≤8 | Supports to configure master or slave mode |
| I2C | ≤8 | Rating up to 100Kbit/s in standard mode, and 400Kbit/s in fast-speed mode, 1000Kbit/ s in enhanced fast-speed mode, 3400Kbit/s in high-speed mode, and 5000Kbit/s in super fast speed mode. |
| I3C | ≤2 | 2 Improved I3C; <br> Support 400Kbit/s fast mode and 1000Kbit/s fast mode enhanced version, and backward compatible with I2C; <br> Support up to 12.5M clock rate, support HDR-DDR mode |
| ADC | ≤4 | 12-bit 4-lane 1MS/s ADC |

■ **Supported OS:**

| OS version | Linux |
|---|---|
| **Firmware installation** | • TF card <br> • USB OTG |

■ **Driver list:**

| Interface | Function | Chipset |
|---|---|---|
| RGMII | Gigabit Ethernet | RTL8211FSI-CG |
| USB | WiFi/ BT | BL-M8723DU1 |
| USB | 4G modem | EC25/EC20 |
| USB | Serial expanding | XR21V1414IM48 |
| I2C | RTC | PCF8563 |
| SAI | Sound card | NAU88C22YG |
| LCD-RGB888 | 7-inch | FIT-LCD7.0 with resolution of 1024x 600 or 800x 480 |
| LCD-RGB888 | 7'' LCD | FIT-LCD7.0V2.1 with resolution of 1024x 600 |
| SD card | TF card | General purpose |
| CAN/CAN-FD | General purpose | General purpose |
| GPIO | / | General purpose |
| ADC | 1 | General purpose |
| PWM | LCD backlight | / |

(Linux5.10 applies to all rows above)

■ **Provided technical files**

| Linux | User manual, compiling guideline, kernel source code, file system, OS image, VM ubuntu image, SD card tool, USB OTG tool, QT demos and source code |
|---|---|
| Hardware | User manual, carrier board schematic, carrier board PCB(AD), datasheet, carrier board and SoM DXF files, pinmux sheet |

■ **Order options:**

| Model | Core number | CPU speed | RAM | Flash | Working temp | Phase |
|---|---|---|---|---|---|---|
| FET-MX91xx-C+141GSE8GIxxx | 1x A55 | A55@1.4GHz | 1GB | 8GB | -40~85℃ | planning |

■ **Development board/ kit**

WiFi & BT　　SIM card slot
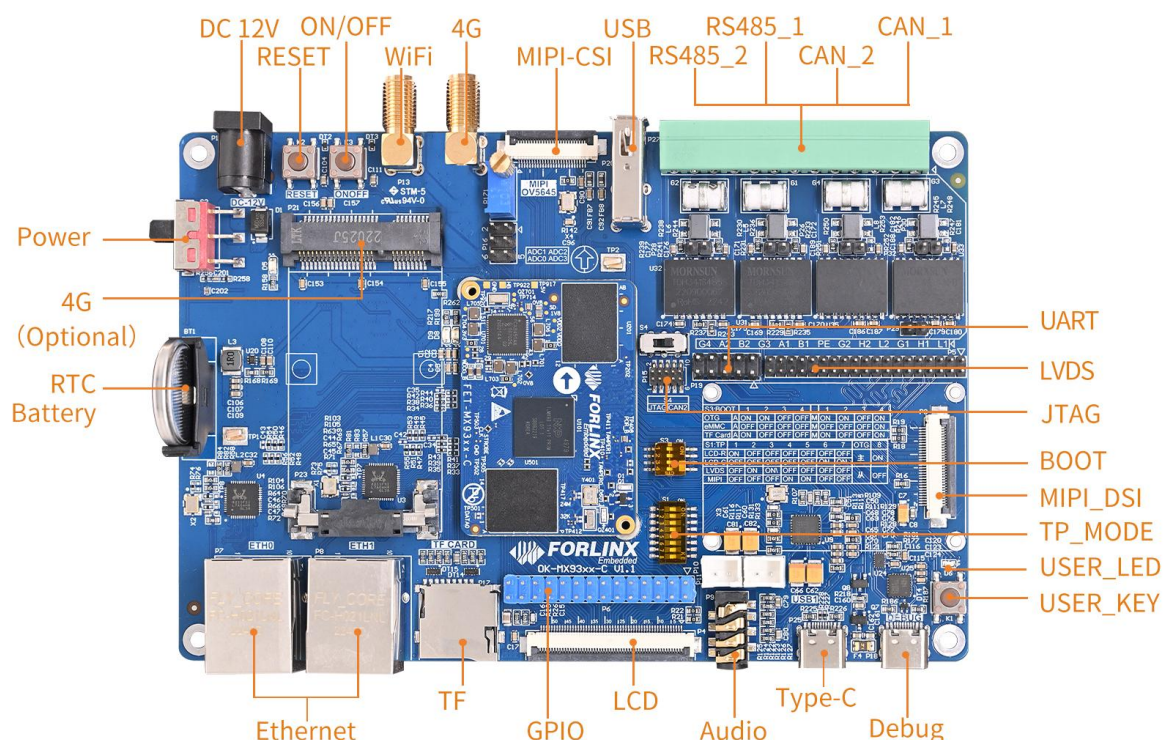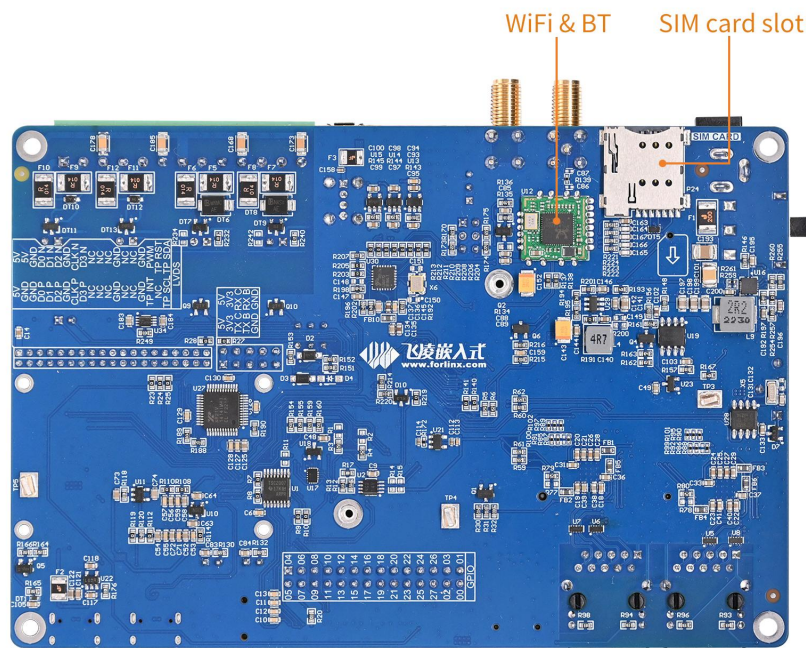


## ■　Carrier board features

| Peripheral | QTY | Spec. |
|---|---|---|
| LCD | 1 | RGB888 24-bit, up to 1366×768p60 or 1280×800p60 |
| LVDS | 1 | single 8-bit, up to 1366×768p60 or 1280×800p60 |
| MIPI-DSI | 1 | 4 lanes, up to 1920×1200p60 |
| TF card slot | 1 | For OS image flashing, complies with SD card 3.0 protocol |
| 4G modem | 1 | Mini-PCIe slot, available for EC20 module with external antenna |
| Ethernet | 2 | 2x 10M/100M/1000M RJ45 connector, ENET1/ETH1 supports TSN |
| GPIO | 28 | dual-row pin headers, multiplexed with LCD |
| ADC | 4 | 12-bit ADC with sampling rate 1MS/s |
| CAN-FD | 2 | with static, surge and pulse protection circuits level 4, and Galvanic isolation complies with CAN2.0B |
| RS485 | 2 | with static, surge and pulse protection circuits level 4, and Galvanic isolation with automatic transceiving control |
| USB2.0 | 2 | USB1 by TYPE-C, can be used for OS image flashing; USB2 is expanded from HUB, circuited to 4G, WiFi /BT, USB to 4 serial, and USB-A female connector |
| UART | 2 | 3.3V TTL, by pin headers with pitch of 2.54mm |
| WiFi& BT | 1 | on-board BL-M8723DU, 2.4GWiFi, Bluetooth 2.1/4.2 |
| RTC | 1 | on-board RTC battery holder, for real-time updating |
| Audio | 1 | 1 four-part phone jack with dual-channel HP and MIC and 2 speaker jacks. |
| Camera | 1 | MIPI-CSI, fits OV5645 module |
| KEY | 3 | reset, power on/ off and user key |
| LED | 1 | user defined |
| Debug | 1 | serial converted to USB for debug, TYPE-C connector |
| JTAG | 1 | 10-pin(2×5) headers with pitch of 2.0mm |