

A secure and connectivity rich NXP i.MX 91 based OSM-MF SOM: Power Efficient Processing, Industrial Peripherals and optional Wi-Fi 6 and Bluetooth 5.4

(Offered with NXP IW611 Wi-Fi 6 and Bluetooth 5.4 – or choose from our broad wireless options!)

Our new Nitrogen iMX91 OSM-MF family is powered by NXP's i.MX 91 processor family, NXP's PCA9451A PMIC, our Sona NX611 (NXP IW611) Wi-Fi 6 and Bluetooth 5.4 wireless module, LPDDR4 RAM, and eMMC storage. The Nitrogen iMX91 OSM-MF is designed to meet the processing and connectivity needs of the commercial, industrial, and medical products. Our flexible production options allow you to choose the RAM, eMMC storage, and Sona Wi-Fi and Bluetooth connectivity that is most optimized for your product. All Nitrogen iMX91 OSM-MF modules come with industry leading software and integration support.

- **Powerful Multiprocessing:** 1.4 GHz Cortex-A55 microprocessor subsystem
- **Offered with Sona NX611 Wi-Fi 6 and Bluetooth 5.4:** Optional wireless based on NXP IW611. Additionally, choose from our Sona TI351, Sona IF513, and Sona IF573 radios.
- **High Speed Interfaces:** Dual USB 2.0 (480 Mbps) and dual Gigabit Ethernet (1 Gbps)
- **Industrial Interfaces:** UART, SDIO, SPI, I2C, CAN-FD, GPIO, and more
- **Software and Board Support Options:** Yocto Linux/Buildroot Linux/Debian for Cortex-A55
- **Secure and Encrypted Boot, Secure Enclave, and Secure File Storage:** Robust, secure, and encrypted boot mechanisms built on NXP's EdgeLock® Secure Enclave ensure only trusted software boots on your device. Store and use keys, certificates, and credentials in a run-time isolated trusted environment.
- **OSM-MF v1.2 Standard Form Factor:** 45mm x 30mm OSM-MF solder down form factor ensures one carrier design can support multiple processor, memory, and wireless configurations.
- **Hardware Upgrade Roadmap:** Build a product design that can easily be upgraded to the latest processors and wireless options as future Ezurio SOMs based on the OSM standard are released.
- **Advanced Common Carrier/Development Board:** Ethernet, USB, CAN, I2C, SPI, UART, SDIO, uSD, power measurement, and more. Use in development and as reference designs for your carrier board design.



Choose the Options That Fit Your Project Needs

Temperature Range: Choose our industrial temperature models for harsh environments or our commercial temperature models for cost optimization

Memory: Choose the LPDDR4 DRAM and onboard eMMC storage sizes that best fits your design's cost and performance.

Wi-Fi and Bluetooth: Select from our line of Sona wireless modules featuring dual band Wi-Fi 6, tri-band Wi-Fi 6E, up to Bluetooth 6.0, and multiple antenna configurations.

Carrier Board Customization: Use our reference carrier board to accelerate your design or we can create a fully custom board solution for your project

Long Term Software Support: Choose from Yocto Linux, Buildroot Linux, Debian for the Cortex-A55. Optional **Security BSP Releases** deliver LTS Linux kernel, Yocto, and Buildroot releases outside our normal cycle to address CVEs, keeping your SBOMs up to date with the latest security fixes.

Device Security: Our optional **Chain of Trust** capability, built on EZ BSP and the NXP EdgeLock Secure Enclave, adds a Secure Device Framework, Production-Grade Image Signing, and Manufacturing Provisioning — including secure and encrypted boot architecture, secure programming of the hardware root of trust and device image, secure generation and provisioning of your device-specific keys and certificates, and a secure signing service for new firmware and certificates.

Key Features



Broad Selection of Peripherals

USB 2.0, Gigabit Ethernet, and TSN, CAN-FD, UART, I2C, SPI, SDIO 3.0/eMMC 5.1 up to UHS-1, 32x GPIO, 4x ADC



OSM-MF v1.2 Compatible

Built in the size optimized 45x30mm OSM Size-MF form factor and pin-compatible with our full range of OSM-MF modules



Robust Software and Board Support

Choose from Yocto Linux, Buildroot Linux, or Debian for Cortex-A55



Secure Enclave and Secure Boot

Secure boot and secure file storage come pre-integrated in our Yocto and Buildroot Linux BSPs, using the EdgeLock Secure Enclave to protect passwords, certificates, and application data.



Choose your Sona Wi-Fi and Bluetooth Module

Select from our line of Wi-Fi 6 and Wi-Fi 6E modules that include up to Bluetooth 6.0 and global radio certifications



Personal Support from Design to Manufacture

Our industry-renowned support and field application engineering team is passionate about helping you speed your design to market.

Application Areas



Smart Building Control, HVAC



Energy Meters, Energy Storage
Smart Electrical Panels



Test and Measurement
Equipment



Smart City



Commercial Food and Beverage
Equipment



Medical Devices

Specifications

Category	Feature	Specification
Processors	Applications Processor	1x Cortex-A55 core @ up to 1.4 GHz
Security	Hardware Root of Trust	EdgeLock® Secure Enclave
Memory	RAM	512MB, 1GB, and 2GB LPDDR4 (2GB LPDDR4 default)
	Storage	16GB to 128 GB eMMC (16GB eMMC default)
Audio	Audio Interfaces	1x I2S
Peripherals Interfaces		2x USB 2.0 (480 Mbps)
		2x Gigabit Ethernet with Energy Efficient Ethernet, IEEE® 1588, and TSN
		2x CAN-FD
		2x 4-wire UART
		2x 2-wire UART
		3x I2C**
		1x SPI
		1x 4-bit SDIO 3.0/eMMC 5.1 up to UHS-1
		32x GPIO
		4x ADC**
Wireless	Sona Wi-Fi and Bluetooth Modules	Sona TI351
		Sona IF513
		Sona NX611
		Sona IF573
Power	Supply Voltage	5V
Physical	Dimensions	OSM-MF v1.2 Standard – 45mm x 30mm
Environmental	Temperature Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
	Lead Free	Lead-free and RoHS-compliant

*Not to OSM-MF v1.2 spec, but pin-compatible with other Ezurio OSM-MF modules

**The additional Interfaces beyond OSM-MF v1.2 spec are available on OSM's GPIO pins

Ordering Information

Part	Description
Evaluation Kits	
EZOMI-913-0216-00158-2-K2	Nitrogen iMX91 OSM-MF Evaluation Kit: Eval Board / SOM on Adapter / i.MX 913 / 2GB RAM / 16GB eMMC / NX611 Wi-Fi-BT / Accessories
EZCBC-000-0000-00000-2-K2	OSM Evaluation Kit: Eval Board / HDMI Adapters / Antennas / Accessories / SOM sold separately
Boards for Evaluation Kits	
EZOMI-913-0216-00000-2-IK	Nitrogen iMX91 OSM-MF SOM on Adapter: i.MX 913 / 2GB RAM / 16GB eMMC / Without Wireless / For Use with OSM Evaluation Kit
EZOMI-913-0216-00184-2-IK	Nitrogen iMX91 OSM-MF SOM on Adapter: i.MX 913 / 2GB RAM / 16GB eMMC / IF513 Wi-Fi-BT / For Use with OSM Evaluation Kit
EZOMI-913-0216-00158-2-IK	Nitrogen iMX91 OSM-MF SOM on Adapter: i.MX 913 / 2GB RAM / 16GB eMMC / NX611 Wi-Fi-BT / For Use with OSM Evaluation Kit
Distribution-stocked super set variants for evaluation and prototyping	
EZOMI-913-0216-00000-2C	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Without Wireless / -40 to +85°C / Cut Tape
EZOMI-913-0216-00184-2C	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona IF513 1MHF4L / -40 to +85°C / Cut Tape
EZOMI-913-0216-00158-2C	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona NX611 1MHF4L / -40 to +85°C / Cut Tape
OSM Boards (iMX 91)	
Without Wireless	
EZOMC-913-0016-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Without Wireless / 0 to +70°C / Tape and Reel
EZOMI-913-0016-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Without Wireless / -40 to +85°C / Tape and Reel
EZOMC-913-0116-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Without Wireless / 0 to +70°C / Tape and Reel
EZOMI-913-0116-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Without Wireless / -40 to +85°C / Tape and Reel
EZOMC-913-0216-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Without Wireless / 0 to +70°C / Tape and Reel
EZOMI-913-0216-00000-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Without Wireless / -40 to +85°C / Tape and Reel
With Sona NX611	
EZOMC-913-0016-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona NX611 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0016-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona NX611 1MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0116-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona NX611 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0116-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona NX611 1MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0216-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona NX611 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0216-00158-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona NX611 1MHF4L / -40 to +85°C / Tape and Reel
With Sona IF513	

Part	Description
EZOMC-913-0016-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona IF513 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0016-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona IF513 1MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0116-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona IF513 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0116-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona IF513 1MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0216-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona IF513 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0216-00184-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona IF513 1MHF4L / -40 to +85°C / Tape and Reel
With Sona IF573	
EZOMC-913-0016-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona IF573 3MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0016-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona IF573 3MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0116-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona IF573 3MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0116-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona IF573 3MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0216-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona IF573 3MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0216-00117-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona IF573 3MHF4L / -40 to +85°C / Tape and Reel
With Sona TI351	
EZOMC-913-0016-00199-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona TI351 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0016-00199-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 512MB / 16GB eMMC / Sona TI351 1MHF4L / -40 to +85°C / Tape and Reel
EZOMC-913-0116-00199-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona TI351 1MHF4L / 0 to +70°C / Tape and Reel
EZOMI-913-0116-00199-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 1GB / 16GB eMMC / Sona TI351 1MHF4L / -40 to +85°C / Tape and Reel
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EZOMI-913-0216-00199-2R	Nitrogen iMX91 OSM-MF: i.MX 913 / 1 A55 / 2GB / 16GB eMMC / Sona TI351 1MHF4L / -40 to +85°C / Tape and Reel