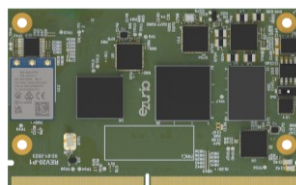


Secure, Smart, Standardized, and Connected IoT: Powerful NXP Edge Processing with Wi-Fi 6 or Wi-Fi 6E

Our customers asked for a high performance, robust SoM that simplifies their BOM, has reliable connectivity, uses a standard form factor, and is globally certified. One with multiple software options, a proven security architecture, long term software support, and security fixes.

Our new Nitrogen8M Plus SMARC is powered by **NXP's innovative i.MX 8M Plus** processor, **NXP PMIC PCA9450**, and our Sona Wi-Fi 6 or 6E and Bluetooth 5.4 wireless module families based on leading NXP and Infineon solutions, high performance LPDDR4 RAM, and eMMC storage. We combine this with our common SMARC carrier board; together they serve as a single board computer (SBC) that can speed your product to market. Alternately, work with us to create a custom carrier that fits your mechanical, environmental, temperature, and interface requirements.

- **Powerful Heterogenous Multiprocessing:** Up to 1.8 GHz quad-core Cortex-A53 MPU and 800 MHz Cortex-M7 MCU allow you to run Linux and an RTOS on dedicated, hardware-firewalled subsystems.
- **Dedicated Machine Learning:** High-performance edge machine learning via an integrated neural processing unit, up to 2.3 TOPS.
- **Diverse Interfaces:** Multiple display, network, data, audio, camera.
- **SMARC 2.2 Standard Form Factor:** 82mm x 50mm SMARC edge connector form factor which includes **onboard ethernet PHYs and a USB hub controller**. One design supports 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 based on the SMARC standard are released.
- **Advanced Common Carrier/Development Board:** Display, camera, audio, Ethernet, USB, PCI-Express, CAN, I2C, SPI, UART, and more. Use in development, as an SBC equivalent in a product, or as reference designs for your carrier board design.



- **Multiple options for Wi-Fi 6 or 6E (802.11ax) and Bluetooth 5.4**
 - Sona IF573 (**Infineon CYW55573**) tri-band Wi-Fi 6E and Bluetooth 5.4
 - Sona NX611 (**NXP IW611**) dual-band Wi-Fi 6 and Bluetooth 5.4
- **Operating Temp:** Commercial (0° to +70 °C) / Industrial Rating (-40° to +85 °C)
- **Multiple high performance memory options:**

2GB LPDDR4 /	4GB LPDDR4 /	8GB LPDDR4 /
16GB eMMC	16GB eMMC	16GB eMMC (MOQ required)
- Extensive range of **pre-certified antennas** for optional Sona wireless modules
- **US based manufacturing with Global Options:** Assembled in USA for local customer base and US market needs. Global manufacturing capability as part of Laird Connectivity footprint, growing reach to EMEA & APAC regions
- **Diverse Software and BSP Options:** Choose from Yocto Linux / Buildroot Linux / Android / Zephyr RTOS / FreeRTOS (Cortex-M7)
- **Power Efficient:** NXP PMIC, power optimized LPDDR4 and eMMC memory, core shut off, clock/voltage scaling, low power interfaces, power optimized single stream Wi-Fi mode enable highly optimized power consumption
- **Long Term Software Support:** Choose from Yocto Linux, Buildroot Linux, Android, or QNX for the Cortex-A53s and FreeRTOS for Cortex-M7. Our **EZ BSP** ensures your Yocto and Buildroot SBOMs stay up to date with the latest security fixes.
- **Device Security:** EZ BSP also enables our **Chain of Trust** service includes secure and encrypted boot architecture, secure programming of the hardware root of trust and device image, secure generation and provisioning of customers specific keys and certificates, and a secure signing service for generating new firmware and certificates.

Key Features



Reliable Connectivity: Optional Wi-Fi 6/6E and BT5.3/5.4

Excellent Wi-Fi and BT Classic / LE connectivity in difficult environments, plus enterprise Wi-Fi support via WPA3-Enterprise for more secure and robust connections.



ML, Graphics, Video, Vision, and Audio – Up to 3 Displays

2.3 TOPS Machine Learning/Neural Processing Unit, up to 1200p60 or 4Kp30 displays, 2 shader GPU, 1080p60 multi codec encode and decode VPU, 2 MIPI-CSI camera interfaces, dedicated Image Signal Processing up to 12 MP, HiFi4 audio DSP



Secure Enclave and Secure Boot Powered by i.MX 8M Plus

Dedicated on-board security hardware, secure boot Linux, and high-performance and flexible secure storage system for passwords, certificates, and data storage.



Robust Software and Speed to Market

Choose from Yocto Linux, Buildroot Linux and Android for the Cortex-A53s; Zephyr RTOS, FreeRTOS for the Cortex-M7



Global Radio Approvals

Carries several modular FCC, IC, CE, UKCA, RCM, MIC, KC, and Bluetooth SIG approvals.



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 Buildings and Appliances



Touchscreens and Displays



Industrial IoT, Vision Systems



Food and Beverage



Medical Devices

Specifications

Category	Feature	Specification
Processors	Microprocessor	4x Cortex®-A53 cores @ up to 1.8 GHz
	Microcontroller	1x Cortex®-M7 core @ 800 MHz
	Audio	Tensilica® HiFi 4 DSP
	Graphics	GC7000UL with 2 shaders for 3D and GC520L for 2D
	Machine Learning	Neural Processing Unit (NPU) with 2.3 TOP/s
Memory	RAM	2GB and 4GB. 8GB with qualifying MOQ. <i>(For custom sizes, please contact Sales)</i>
	Storage	16GB. <i>(For custom sizes, please contact Sales)</i>
Machine Learning	Neural Processing Unit	- Keyword detect, noise reduction, beamforming - Speech recognition (i.e. Deep Speech 2) - Image recognition (i.e. ResNet-50)
Graphics and Video	Graphics Processing Unit	166 million triangles/sec 1.0 giga pixel/sec 16 GFLOPs 32-bit - OpenGL ES 1.1, 2.0, 3.0, OpenCL 1.2, Vulkan 2D acceleration
	Video Processing Unit	Video Decode 1080p60 HEVC/H.265 Main, Main 10 (up to level 5.1) 1080p60 VP9 Profile 0, 2 1080p60 VP8 1080p60 AVC/H.264 Baseline, Main, High decoder Video Encode 1080p60 AVC/H.264 encoder 1080p60 HEVC/H.265 encoder
	Display Interfaces	1x MIPI DSI, up to UWHd and WUXGA 1x LVDS Tx, up to 1920x1080p60 1x HDMI 2.0a Tx, up to 4kp30
Vision	Camera	1x 4-lane MIPI CSI, 1x 2-lane MIPI CSI
	Image Signal Processor	375 Mpixel/s HDR ISP supporting configurations, such as 12MP@30fps, 4kp45, or 2x 1080p80
Audio	Audio Interfaces	2x I2S (Optionally 1 as HDA) - eARC/ARC (HDMI) - ASRC
Peripherals	Input/Output	1x PCIe Gen3 1-Lane Dual Mode with PHY 2x USB 3.0/2.0 with PHY 2x USB 2.0 with PHY 2x Gbit Ethernet with IEEE® 1588, AVB (One also supports TSN) 2x CAN (Optionally CAN-FD on I-Temp) 3x UART 5 Mbit/s 5x I2C 2x SPI 1x SDIO 3.0/eMMC 5.1 14x GPIO
Optional Wireless Specification	Wi-Fi	Wi-Fi 6 or Wi-Fi 6E
	Frequency	Dual-Band 2.4GHz & 5GHz or Tri-Band 2.4GHz, 5GHz & 6GHz
	Bluetooth	Bluetooth 5.3 or Bluetooth 5.4
Supply Voltage		5 V
Physical	Dimensions	SMARC 2.2 Standard - 82mm x 50mm
Environmental	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
Miscellaneous	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software
Qualifications	Bluetooth® SIG	Bluetooth SIG Qualified Listing
Regulatory	Approvals	FCC/IC/CE/MIC/RCM

For full specifications on the Nitrogen8M Plus SMARC, please see the appropriate datasheet.

Ordering Information

Part	Description
N8MP_SMARC_SOM_2r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC
N8MP_SMARC_SOM_2r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_4r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC
N8MP_SMARC_SOM_4r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_8r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC
N8MP_SMARC_SOM_8r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_2r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_2r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_4r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_4r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_8r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_8r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_2r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_2r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / IF573 / -40 to +85°C
N8MP_SMARC_SOM_4r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_4r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / IF573 / -40 to +85°C

Part	Description
N8MP_SMARC_SOM_8r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_8r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / IF573 / -40 to +85°C
450-00238	Universal Heatsink for SMARC
SMARC_CAR	Universal Carrier Board Kit – Includes, antennas, power supply, DB9 cable
SMARC_CAR_BRD	Universal Carrier Board – Board Only (Note - SOM sold separately)

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