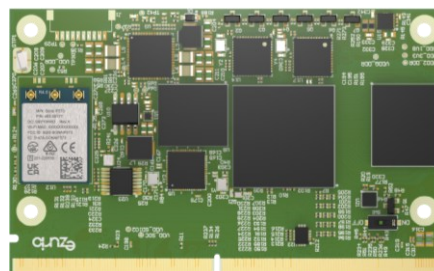


A secure NXP i.MX 95 based SMARC SOM: Triple Display, 3D Graphics, PCIe 3, USB3, AI, Multi-Camera, 4K Video, Wi-Fi 6 or 6E, and Bluetooth 5.4

Our new Nitrogen95 SMARC family is powered by NXP's i.MX 95 processor family, NXP's PF09 PMIC and PF53 Regulators, our Sona Wi-Fi + BT wireless modules, LPDDR5 RAM, and eMMC storage. The Nitrogen95 SMARC is designed to meet the needs of the most demanding commercial, industrial, and medical HMI products. Our in-house USA based assembly allows you to choose the best RAM, storage, and connectivity options for your product. All Nitrogen95 SMARC modules come with our industry leading software and integration support.



- **Powerful Heterogenous Multiprocessing:** Up to 1.8 GHz 6x Cortex-A55 microprocessor, an 800 MHz Cortex-M7 microcontroller, and a 333 MHz Cortex-M33 microcontroller allows you to run multiple Linux instances in virtual machines and two RTOS instances in their own dedicated, hardware-firewalled subsystems.
- **High Performance Graphics and Display:** Up to three independent displays with resolutions up to 4K, tablet-class up to 64 GFLOPS GPU, and hardware accelerated video decode up to 4K60P
- **Advanced Vision Pipeline:** Support multiple camera via dual MIPI-CSI with virtual channels, onboard image signal processor (500 MP/s), video encode up to 4K60P
- **Dedicated AI Accelerator:** High-performance edge AI via an integrated NXP eIQ® Neutron NPU, delivering up to 2 TOPS.
- **High Speed Interfaces:** Dual PCI-Express Gen3 (8.0 Gbps), USB 3.1 Gen1 (5 Gbps), USB 2.0 (480 Mbps), 2x Gb Ethernet (1 Gbps), and 10 Gb Ethernet (10 Gbps)
- **Industrial Interfaces:** UART, SPI, I2C, I2S, CAN-FD, GPIO, SDIO, and more
- **Software and Board Support Options:** Yocto Linux / Buildroot Linux / Android / QNX / Debian for Cortex-A55s, FreeRTOS for the Cortex-M7 and Cortex-M33
- **SMARC 2.1.1 Standard Form Factor:** 82mm x 50mm SMARC edge connector form factor includes **onboard ethernet PHYs**. One design supports multiple processor, memory, and wireless configurations. Allows a **hardware upgrade roadmap** to the latest processors and wireless options as future Ezurio SMARC SOMs are released.
- **Advanced Common Carrier/Development Board:** Display, camera, audio, Ethernet, USB, PCI-Express, CAN, I2C, SPI, UART, and more. Use in development and as reference designs for your carrier board design.
- **Assembled in the USA**

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 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 5.4, 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, Android, Debian, or QNX for the Cortex-A55s, FreeRTOS for the Cortex-M7, and NXP System Manager for Cortex-M33. Optional **Summit Suite Vulnerability Monitoring and Remediation** ensures your Yocto and Buildroot SBOMs stay up to date with the latest security fixes.

Device Security: Our optional **Summit Suite 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



Graphics, Displays, AI, Vision, and Cameras

Up to 3 independent displays, tablet-class GPU, HW video encode/decode, AI accelerator, hardware image processing, and multi-camera support



SMARC v2.1.1 Compatible

Built in the flexible 82mm x 50mm SMARC edge connector form factor and pin-compatible with our full range of SMARC modules



Robust Software and Board Support Support

Choose from Yocto Linux, Buildroot Linux, Android, Debian, or QNX for Cortex-A55s, FreeRTOS for Cortex-M7 and Cortex-M33



Secure Enclave and Secure Boot

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



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 5.4 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



Medical Devices



Industrial HMI



Marine Equipment



Test and Measurement Equipment



Industrial Vision and Camera Systems



Smart Commercial and Industrial Signage

Specifications

Category	Feature	Specification
Processors	Applications Processor	6x Cortex-A55 cores @ up to 1.8 GHz
	Real-Time Microcontroller	1x Cortex-M7 core @ up to 800 MHz
	System Management MCU	1x Cortex-M33 core @ up to 333 MHz
	GPU	Arm® Mali G310 v2
	AI/DSP	NXP eIQ® Neutron Neutron N3-1024S NPU
Memory	RAM	4GB, 8GB, and 16GB LPDDR5
	Storage	16GB eMMC
Graphics and Video	Display Interfaces	1x MIPI DSI*, up to 4K (3840 x 2160) @ 30 fps or 3840 x 1440 @ 60 fps 2x LVDS, up to 1920 x 1080 @ 60 fps in Dual Link
	Graphics Processing Unit	Up to 64 GFLOPS (fp32), OpenGL ES3.2, Vulkan 1.3, and OpenCL 3.0 API support
	Video Encoder/Decoder	Support for up to 4K @ 60 fps, HEVC (H.265) and H.264 codecs
Vision	Camera	2x 4-lane MIPI-CSI-2*, up to 8x cameras with MIPI virtual channels
	Image Signal Processor	500 MP/s with HDR support
Audio	Audio Interfaces	2x I2S
Peripherals	Interfaces	2x PCIe Gen3 1-lane (8 Gbps)
		2x USB 3.1 Gen1 (5 Gbps)
		3x USB 2.0 (480 Mbps)
		2x Gbit Ethernet with IEEE® 1588 and TSN and onboard PHY
		1x 10Gbit Ethernet** with IEEE® 1588 and TSN
		2x CAN-FD
		4x UART
		5x I2C
		2x SPI
		1x SDIO 3.0/eMMC 5.1
		13x GPIO
		Sona NX611
		Sona IF573
		Sona IF513
		Sona TI351
Wireless	Sona Wi-Fi and Bluetooth Modules	
Supply Voltage		5V
Physical	Dimensions	SMARC v2.1.1 Standard – 82mm x 50mm
Environmental	Temperature Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
	Lead Free	Lead-free and RoHS-compliant

*Feature depends on part number ordered

**Not to SMARC v2.1.1 spec

Ordering Information

Part	Description
N95_SMARC_SOM_4r16e	Nitrogen95 SMARC SOM: i.MX 959 6x / 4GB / 16GB eMMC / 0 to +70°C / Without Wireless
N95_SMARC_SOM_8r16e	Nitrogen95 SMARC SOM: i.MX 959 6x / 8GB / 16GB eMMC / 0 to +70°C / Without Wireless
N95_SMARC_SOM_4r16e_i	Nitrogen95 SMARC SOM: i.MX 959 6x / 4GB / 16GB eMMC / -40 to +85°C / Without Wireless
N95_SMARC_SOM_8r16e_i	Nitrogen95 SMARC SOM: i.MX 959 6x / 8GB / 16GB eMMC / -40 to +85°C / Without Wireless
N95_SMARC_SOM_4r16e_IF573_3M	Nitrogen95 SMARC SOM: i.MX 959 6x / 4GB / 16GB eMMC / IF573 / 0 to +70°C
N95_SMARC_SOM_8r16e_IF573_3M	Nitrogen95 SMARC SOM: i.MX 959 6x / 8GB / 16GB eMMC / IF573 / 0 to +70°C
N95_SMARC_SOM_4r16e_IF573_3M_i	Nitrogen95 SMARC SOM: i.MX 959 6x / 4GB / 16GB eMMC / IF573 / -40 to +85°C
N95_SMARC_SOM_8r16e_IF573_3M_i	Nitrogen95 SMARC SOM: i.MX 959 6x / 8GB / 16GB eMMC / IF573 / -40 to +85°C
450-00218	Heatsink for Nitrogen Nitrogen95 SMARC family
SMARC_CAR	Kit - Universal SMARC Carrier Board. Includes antennas, power supply, DB9 cable (Note - SOM sold separately)
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

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