SECURE, SMART, STANDARDIZED, AND CONNECTED IoT: POWERFUL NXP EDGE PROCESSING WITH WI-FI 6 OR WI-FI 6E

Featuring **NXP i.MX 8M Mini** with optional **NXP** and **Infineon** based **Wi-Fi 6** or **Wi-Fi 6E** with **Bluetooth 5.3/5.4** wireless onboard

MADE IN THE USA

Up to 1.8 GHz quad-core Cortex-A53 and **400 MHz Cortex-M4**

GOLD PARTNER NXP

Infineon Premium Partner

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 Mini SMARC is powered by **NXP's class-leading i.MX 8M Mini** processor, NXP **PMIC PF8121**, and our Sona WiFi 6/6E and Bluetooth 5.3/5.4 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 can 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 microprocessor and 400 MHz Cortex-M4 microcontroller allow you to run Linux and an RTOS on dedicated, hardware-firewalled subsystems.
- **Diversity of Interfaces:** Display, network, data, audio and camera interfaces.
- **SMARC 2.1.1 Standard Form Factor: 82mm x 50mm** SMARC edge connector form factor which includes **onboard ethernet PHY 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 Laird Connectivity SOMs based on the SMARC standard are released.
- **Advanced Common Carrier/Development Board:** Display, camera, audio, Ethernet, USB, PCI-Express, 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 6/6E** (802.11ax) and **Bluetooth 5.3/5.4**
  - Sona NX611 **(NXP IW611)** dual-band Wi-Fi 6 and Bluetooth 5.3
  - Sona IF573 **(Infineon CYW55573)** tri-band Wi-Fi 6E and Bluetooth 5.4
- **Operating Temperate Range**
  - Commercial Rating (0° to +70 °C)
  - Industrial Rating (-40° to +85 °C)
- **Multiple high performance memory options**:

1GB LPDDR4 /	2GB LPDDR4 /	4GB LPDDR4 /
16GB eMMC	16GB eMMC	16GB eMMC

- Extensive range of **pre-certified antennas** for optional Sona wireless modules
- **US based manufacturing with Global Options:** Manufacture 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 Board Support Options:** Choose from Yocto Linux/Buildroot Linux/Android/Ubuntu for Cortex-A53s, Zephyr RTOS/FreeRTOS for the Cortex-M7
- **Secure and Encrypted Boot, Secure Enclave, and Secure File Storage:** Robust, secure, and optionally encrypted boot mechanism to ensure only trusted software boots on your device. Optionally store and use secure keys, certificates, and credentials in run-time isolated trusted environment.
- **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 hardware availability and software support:** Laird Connectivity's products are specifically designed to meet the needs of the industrial and medical markets, which typically require 10 year or more product lifecycles. Long-term software support includes LTS Yocto Linux and Zephyr RTOS support with vulnerability remediation.

FEATURES AT A GLANCE

RELIABLE CONNECTIVITY: OPTIONAL WI-FI 6/6E AND BT 5.3/5.4
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.

GRAPHICS, VIDEO, VISION, AND AUDIO
MIPI-DSI or LVDS display up to 1080p60, GPU, 1080p60 multi codec encode and decode VPU, MIPI-CSI camera interface, I2S audio interfaces

SECURE ENCLAVE AND SECURE BOOT POWERED BY I.MX 8M MINI
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, Android, and Ubuntu for the Cortex-A53s, Zephyr RTOS and FreeRTOS for the Cortex-M7

GLOBAL RADIO APPROVALS
Sona wireless modules carry 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

KEY SPECIFICATIONS

CATEGORY	FEATURE	SPECIFICATION		
Processors	Microprocessor	4x Cortex®-A53 cores @ up to 1.8 GHz		
	Microcontroller	1x Cortex®-M4 core @ 400 MHz		
	Graphics	GC7000NanoUltra for 3D and GC520L for 2D		
Memory	RAM	1GB, 2GB, and 4GB		
	Storage	16GB. *(For custom sizes, please contact Sales)*		
Graphics and Video	Graphics Processing Unit	▪ 50 million triangles/sec ▪ 500 megapixel/sec	▪ 8 GFLOPs 32-bit ▪ OpenGL ES 2.0	▪ 2D acceleration
	Video Processing Unit	**Video Decode** ▪ 1080p60 HEVC/H.265 ▪ 1080p60 VP9 Profile 0, 2 ▪ 1080p60 VP8 ▪ 1080p60 AVC/H.264 Baseline, Main, High decoder	**Video Encode** ▪ 1080p60 AVC/H.264 encoder	
	Display Interfaces	▪ 1x MIPI DSI, up to 1080p60 ▪ 1x LVDS, up to 1080p60 (Optional, MOQ required)		
Vision	Camera	▪ 1x 4-lane MIPI CSI		
Audio	Audio Interfaces	▪ 2x I2S (Optionally 1 as HDA) ▪ 1x PCM (for onboard optional Bluetooth)		
Peripherals	Input/Output	▪ 1x PCIe Gen2 1-Lane Dual Mode with PHY ▪ 3x USB 2.0 with PHY ▪ 1x Gbit Ethernet including PHY with IEEE® 1588, AVB, EEE	▪ 3x UART ▪ 5x I2C ▪ 2x SPI ▪ 1x SDIO 3.0/eMMC 5.1 ▪ 14x GPIO	
Optional Wireless Specification	Wi-Fi	Wi-Fi 6/6E (802.11ax)		
	Frequency	Dual-Band 2.4GHz & 5GHz or Tri-Band 2.4GHz, 5GHz, & 6GHz		
	Bluetooth	Bluetooth 5.3/5.4		
Supply Voltage		5 V		
Physical	Dimensions	SMARC 2.1.1 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 on optional Sona wireless modules		

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

Part #	Description
8MM_SMARC_SOM_1r16e	SMARC SOM: i.MX8M MINI Quad / 1GB / 16GB eMMC
8MM_SMARC_SOM_2r16e	SMARC SOM: i.MX8M MINI Quad / 2GB / 16GB eMMC
8MM_SMARC_SOM_4r16e	SMARC SOM: i.MX8M MINI Quad / 4GB / 16GB eMMC
8MM_SMARC_SOM_1r16e_i	SMARC SOM: i.MX8M MINI Quad / 1GB / 16GB eMMC / -40 to +85C
8MM_SMARC_SOM_2r16e_i	SMARC SOM: i.MX8M MINI Quad / 2GB / 16GB eMMC / -40 to +85C
8MM_SMARC_SOM_4r16e_i	SMARC SOM: i.MX8M MINI Quad / 4GB / 16GB eMMC / -40 to +85C
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

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