Bd Boundary Devices
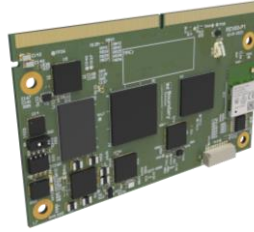a **Laird Connectivity™** company

SECURE, SMART, STANDARDIZED, AND CONNECTED IoT: POWERFUL NXP EDGE PROCESSING WITH WI-FI 5 AND BLUETOOTH 5.2

Featuring **NXP i.MX 8M Plus** and Sterling-LWB5+ **(Infineon CYW4373E)**

Up to **1.8 GHz quad-core Cortex-A53** and **800 MHz Cortex-M7**

Wi-Fi 5 (**802.11ac**) and **Bluetooth 5.2**

MADE IN THE USA

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 Plus SMARC is powered by **NXP's innovative i.MX 8M Plus** processor, NXP **PMIC PCA9450,** and our Sterling LWB5+ WiFi 5 / Bluetooth 5.2 radio based on **Infineon's CYW4373E**, 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 microprocessor and 800 MHz Cortex-M7 microcontroller 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, delivering up to 2.3 TOPS.
- **Diversity of Interfaces:** Multiple 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 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 Laird Connectivity SOMs 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.

- **Wi-Fi 5** (802.11ac) and **Bluetooth 5.2** Classic & Low Energy (LE)
- **Operating Temperate Range**
  - Commercial Rating (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 Sterling-LWB5+
- **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: WI-FI 5 AND BT 5.2
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, Android, and Ubuntu for the Cortex-A53s, Zephyr RTOS and 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

Interesting in our Nitrogen8M Plus SMARC?
Visit us at **http://www.boundarydevices.com/nitrogen8m-plus-smarc**

KEY 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. *(For custom sizes, please contact Sales)*		
	Storage	16GB. *(For custom sizes, please contact Sales)*		
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	
Wireless Specification	Wi-Fi	Wi-Fi 5 (802.11ac)		
	Frequency	Dual-Band 2.4GHz & 5GHz		
	Bluetooth	Bluetooth 5.2		
	Transmit Power	+ 18 dBm (maximum)		
	Antenna Options	MHF4 connector for external antenna		
	Raw Data Rates (Air)	Wi-Fi 5 433.3Mbit/s - MCS9, 80MHz, 256QAM, SGI		
Key Wi-Fi Features	Wi-Fi 5 (802.11ac)	▪ IEEE 802.11 a/b/g/n/ac ▪ 20, 40 & 80MHz bandwidth support	▪ OFDM	
Key Bluetooth Features	Bluetooth V	▪ Classic Bluetooth – BR / EDR ▪ Central / Peripheral Modes	▪ Up to 7 Bluetooth LE connections ▪ LE Secure Connections	
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		

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

Part #	Description
N8MP_SMARC_SOM_2r16eWB	SMARC SOM: i.MX8M Quad Plus / 2GB / 16GB eMMC / LWB5+
N8MP_SMARC_SOM_4r16eWB	SMARC SOM: i.MX8M Quad Plus / 4GB / 16GB eMMC / LWB5+
N8MP_SMARC_SOM_2r16eWB_i	SMARC SOM: i.MX8M Quad Plus / 2GB / 16GB eMMC / LWB5+ / Industrial Temp
N8MP_SMARC_SOM_4r16eWB_i	SMARC SOM: i.MX8M Quad Plus / 4GB / 16GB eMMC / LWB5+ / Industrial Temp
N8MP_SMARC_SOM_8r16eWB	SMARC SOM: i.MX8M Quad Plus / 8GB / 16GB eMMC / LWB5+ (MOQ requirements)
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

Boundary Devices' products are subject to standard Terms & Conditions.