Boundary Devices
a Laird Connectivity™ company

Nitrogen8ULP SOM

i.MX 8ULP

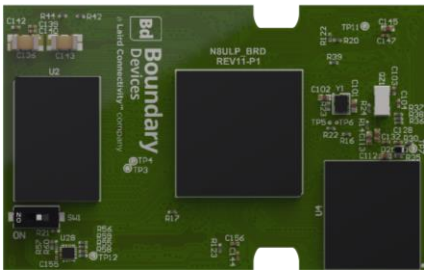
Next Generation Low Power, Sized Optimized, and Smart IoT: Power Efficient NXP Edge Processing

MADE IN THE USA

Featuring **NXP i.MX 8ULP and PCA9460A PMIC** with **eMMC** and **LPDDR4 DRAM**

Up to 800 MHz dual-core Cortex-A35 and **216 MHz Cortex-M33F**

Low Power Multiprocessing**: 20 different power modes**



GOLD PARTNER NXP

Our customers asked for a low power, compact, peripheral rich, and robust SoM that simplifies their BOM. One with multiple software options, a proven security architecture, long term software support, and security fixes.

Our new Nitrogen8ULP SOM is powered by the next generation low power **NXP i.MX 8ULP** processor and it's specifically designed **NXP PMIC PCA9460A.** It features power efficient LPDDR4 RAM and eMMC storage. We combine this with a specifically designed 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.

- **Low Power Heterogenous Multiprocessing:** Up to 800 MHz dual-core Cortex-A35, ARM's lowest power 64-bit MPU architecture, and 216 MHz Cortex-M33 MCU to run Linux and an RTOS on dedicated, hardware-firewalled subsystems.
- **Power Efficient: µPower management subsystem** in the i.MX 8ULP, delivering 20 different power modes, combined with an NXP PMIC, power optimized LPDDR4 and eMMC memory to optimize core shut off, clock/voltage scaling, low power interfaces, all to enable highly optimized power consumption.
- **Tensilica® HiFi 4 DSP:** High-performance audio DSP for advanced audio/voice processing while using minimal power consumption.
- **Tensilica® Fusion F1 DSP:** Low power DSP for keyword detection and sensors.
- **Graphics and Display:** 4-lane MIPI-DSI with GPU supporting 3D accelerated OpenGL ES 3.1, Vulkan, OpenVG 1.1, OpenCL 2.x, OpenVG 1.1 and 2D graphics.
- **Diversity of Interfaces:** Display, network, data, audio and camera interfaces.
- **Compact and Rugged Form Factor:** Size optimized **51mm x 32mm** form factor with board-to-board connectors
- **Advanced carrier/Development Board:** Display, camera, audio, Ethernet, USB, CAN, I2C, SPI, UART, and more. Use in development, as an SBC equivalent in a product, or as reference designs for your carrier board.
- **Easy Integration** with Laird Connectivity's portfolio of compact and low power Wi-Fi and Bluetooth modules
- **Operating Temperate Range:**
  - Commercial Rating (0° to +70 °C)
  - Industrial Rating (-40° to +85 °C) *(For I-Temp options, contact Sales)*
- **High performance memory:**
  2GB LPDDR4 / 16GB eMMC
- **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:** including Yocto Linux, Buildroot Linux, Ubuntu Linux, and Android for the Cortex-A35 and FreeRTOS for the Cortex-M33. **Long-term software support** options include LTS Yocto Linux with vulnerability remediation.
- **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.
- **Long term hardware availability:** 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.

FEATURES AT A GLANCE

LOW POWER MULTIPROCESSING W/DEDICATED POWER MANAGEMENT

ARM's lowest power 64-bit microprocessor architecture, Cortex-A35, plus NXP's dedicated µPower management subsystem which delivers 20 different power modes.

GRAPHICS, VISION, AUDIO, DSPS, AND INDUSTRIAL PERIPHERALS

3D GPU, 2D Engine, MIPI-DSI display interface, MIPI-CSI camera interface, HiFi 4 DSP, Fusion F1 DSP, I2S audio interfaces, CAN/CAN-FD, USB, Ethernet, and more

SECURE ENCLAVE AND SECURE BOOT POWERED BY I.MX 8ULP

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, Ubuntu, and Android for the Cortex-A35s, FreeRTOS for the Cortex-M33.

LONG TERM HARDWARE AVAILABILITY

Specifically designed to meet the needs of the industrial and medical markets, which typically require 10 year or more product lifecycles.

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

- Energy Meters, Energy Storage Smart Electrical Panels
- Smart City, Smart Camera
- Smart Building Control, HVAC
- Portable Patient Monitors, Medical Devices
- Handheld Printers and Scanners
- Commercial Food and Beverage Equipment

Interesting in our Nitrogen93 SMARC?
Visit us at **https://www.lairdconnect.com/nitrogen8ulp-som**

KEY SPECIFICATIONS

CATEGORY	FEATURE	SPECIFICATION
Processors	Microprocessor	2x Cortex®-A35 cores @ up to 800 MHz
	Microcontroller	1x Cortex®-M33F core @ 216 MHz
	Graphics	GC7000 nanoULTRA31 3D GPU and GC328 2D Engine
	Audio	Tensilica® HiFi 4 DSP
	Low Power DSP	Tensilica® Fusion F1 DSP
Memory	RAM	2GB (*For custom sizes, please contact Sales)*
	Storage	16GB *(For custom sizes, please contact Sales)*
Graphics and Video	Graphics Engine	▪ 3D GPU ▪ OpenGL ES 3.1, Vulkan, OpenVG 1.1, OpenCL 2.x, OpenVG 1.1 ▪ 2D Engine
	Display Interfaces	1x 4-lane MIPI DSI, up to 1920x1200p60
Vision	Camera	▪ 1x 2-lane MIPI CSI
Audio	Audio Interfaces	▪ 7x I2S ▪ 7x DigMIC ▪ 5x SPDIF ▪ 1x MQS
Peripherals	Input/Output	▪ 2x USB 2.0 with PHY ▪ 1x 10/100 Mbit/s Ethernet with support for IEEE® 1588 ▪ 1x CAN/CAN-FD ▪ 8x UART ▪ 7x I2C ▪ 6x SPI ▪ 3x I3C ▪ 2x SDIO 3.0/eMMC 5.1 ▪ 14x GPIO ▪ 2x 12-bit ADC ▪ 2x 12-bit DAC ▪ 2x Analog Comparator ▪ 8x 32-bit Timers ▪ 4x Watchdog Timers
Supply Voltage		5 V
Physical	Dimensions	Board to Board Connectors - 51mm x 32mm
Environmental	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial) (*For industrial temperature options, please contact Sales)*
Miscellaneous	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software

For full specifications on the Nitrogen8ULP, please see the appropriate datasheet.

Part # (Tentative)	Description
8ULP_SOM_2r16e	Nitrogen8ULP SOM: i.MX 8UPL Dual / 2GB / 16GB eMMC /0 to +70°C / Without Wireless
8ULP_SOM_2r16e_i	Nitrogen8ULP SOM: i.MX 8UPL Dual / 2GB / 16GB eMMC /-40 to +85°C / Without Wireless
N8ULP_CAR_BRD	Nitrogen8ULP Carrier Board (Note - SOM sold separately)