

INDUSTRIAL PRODUCT DATASHEET

Seeed Studio XIAO nRF54LM20A Sense

Seeed Studio XIAO nRF54LM20A Sense is an ultra-low-power multiprotocol wireless development board with onboard motion and audio sensors for battery-powered IoT, wearables, TinyML, and voice-triggered applications.

SKU	UPDATED	PRICE
100018440	2026-09-04 09:00:56	\$15.90(Excl. VAT)



Overview



Seeed Studio XIAO nRF54LM20A Sense is a compact, ultra-low-power wireless development board powered by Nordic Semiconductor's nRF54LM20A SoC, featuring a 128 MHz Arm Cortex-M33 processor, 512 KB RAM, 2 MB on-chip NVM, multiprotocol 2.4 GHz connectivity, onboard IMU, digital microphone, 8MB external flash, IPEX antenna connector, and Nordic nPM1300 PMIC. It supports Bluetooth LE, Bluetooth Channel Sounding, Bluetooth Mesh, Thread, Zigbee, Matter, and proprietary 2.4 GHz protocols up to 4 Mbps, making it ideal for wearables, smart sensing, TinyML, gesture recognition, voice-triggered devices, and battery-powered IoT applications.

Key Features

Powerful SoC with Advanced Connectivity & Security

Seeed Studio XIAO nRF54LM20A Sense is a compact, ultra-low-power wireless development board powered by Nordic Semiconductor's nRF54LM20A SoC. It features a 128 MHz Arm Cortex-M33 processor, 512 KB RAM, 2 MB on-chip NVM, a 128 MHz RISC-V coprocessor, multiprotocol 2.4 GHz wireless connectivity, onboard IMU, digital microphone, 8MB external flash, IPEX antenna connector, and Nordic nPM1300 PMIC for efficient power management.

With support for Bluetooth LE, Bluetooth Channel Sounding, Bluetooth Mesh, Thread, Zigbee, Matter, and proprietary 2.4 GHz protocols up to 4 Mbps, this board is built for next-generation connected products. The onboard motion and audio sensors make it ideal for wearables, smart sensing, TinyML, gesture recognition, voice-triggered devices, and battery-powered IoT applications.

Comprehensive security features include secure boot, secure firmware updates, secure storage, TrustZone-enabled trusted execution environment, cryptographic acceleration with side-channel protection, and tamper detection, ensuring robust protection for IoT deployments.

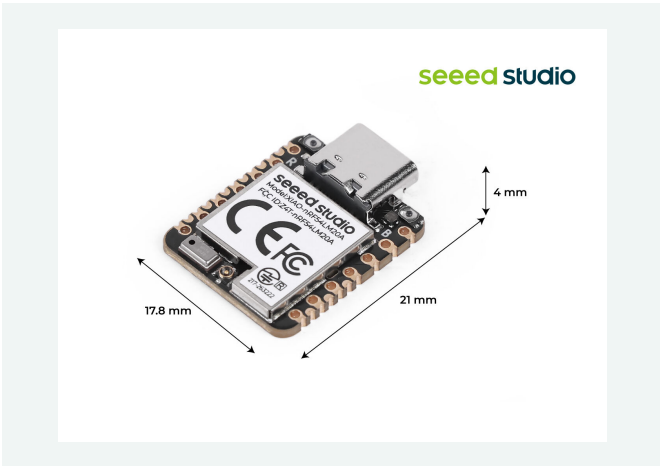
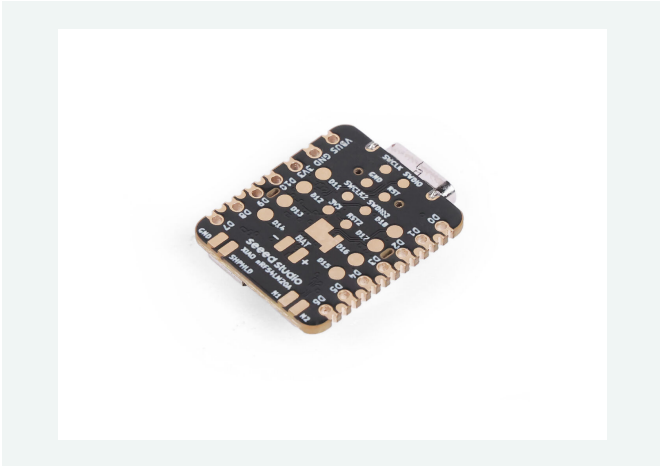
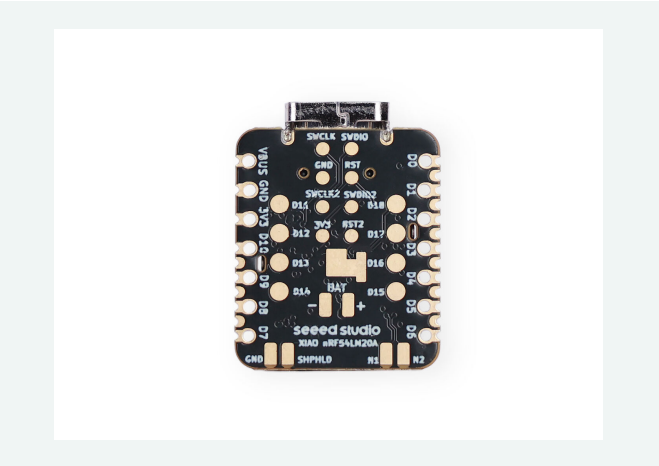
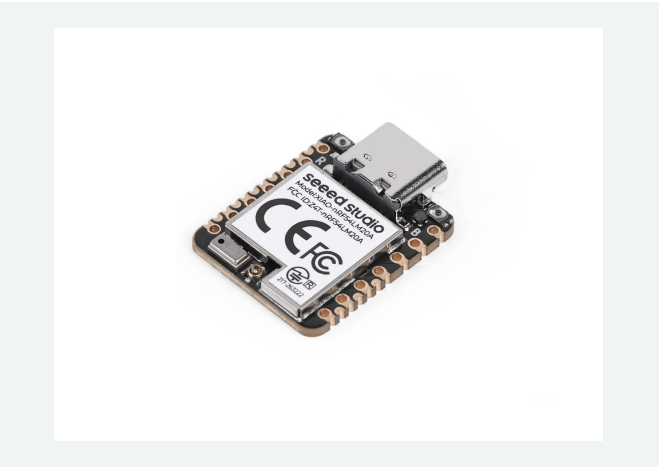
Ultra-Low Power Efficiency

Built on Nordic nRF54LM20A and nPM1300 PMIC, XIAO nRF54LM20A Sense achieves a measured deep sleep current of only 4.76 μA under BAT power. Combined with the nPM1300 PMIC and its 0.33 μA Ship Mode BAT current, in active wireless operation, it records an average current of 3.87 mA with a 3.7 V simulated battery input and TX power set to +8 dBm, the board is ideal for long-life battery-powered sensing applications, wearables, and always-on IoT devices.

Streamlined Development Experience

Full support for Nordic nRF Connect SDK and PlatformIO (Zephyr) enables efficient embedded development workflows. Arduino IDE support available through nrf54-arduino-core.

Product Gallery

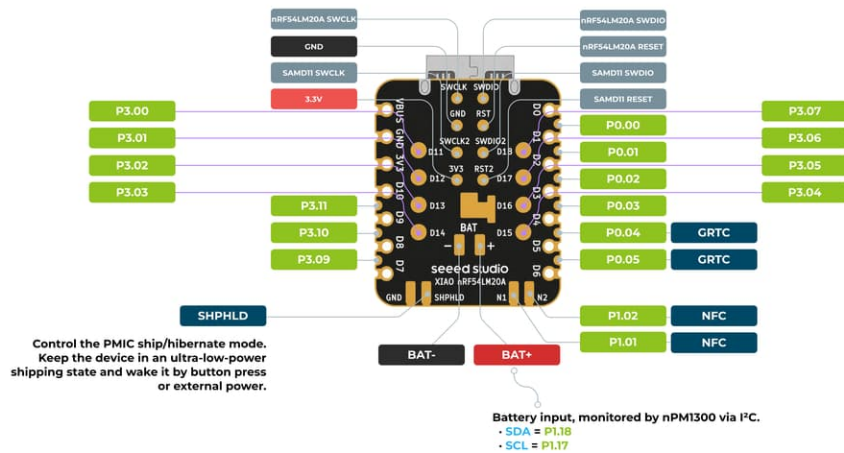
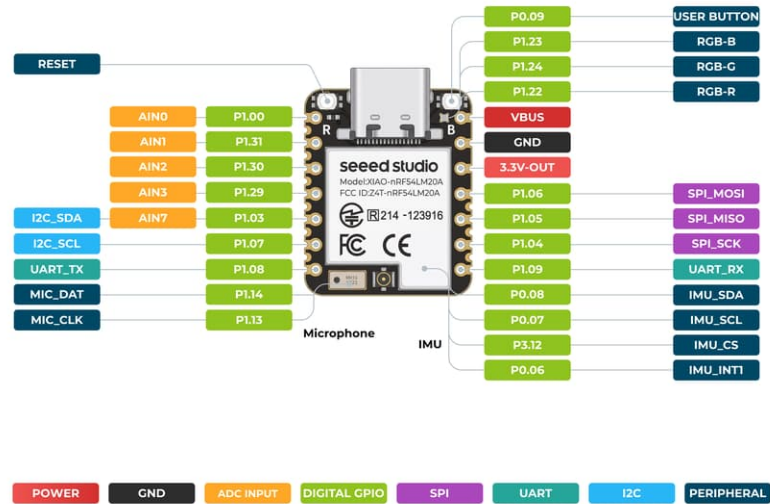


Specification

Product Name	Seeed Studio XIAO nRF54LM20A	Seeed Studio XIAO nRF54LM20A Sense
Chipset	nRF54LM20A nRF54LM20B Datasheet	

Processor	Arm® Cortex®-M33 128 MHz	
	RISC-V 128 MHz Coprocessor	
RAM	512KB	
Flash	2 MB Non-volatile Memory (NVM)	
External Flash	8 MB onboard external flash	
PMIC / Battery	nPM1300 PMIC for power regulation and battery charging	
Interface	28x GPIO Pin	
	9x Analog Pin	
	1x I2C	
	1x UART	
	1x SPI	
	1x NFC	
Onboard	1 x SHPHLD	
	1x User LED (R\G\B 3 Color)	
	1x Charge LED (Battery Charging Indicator)	
	1x Reset Button	
	1x User Button	
	1x IPEX4 Connector (for external antenna)	
	/	1x 6-Axis IMU 1x PDM Microphone
Wireless Connectivity	Bluetooth LE 6.0 (include Channel Sounding)	
	Bluetooth Mesh	
	NFC	
	Thread	
	Zigbee	
	Matter	
	Amazon Sidewalk	
	Proprietary 2.4 GHz protocols	
Power Input	Type-C: 5V	
	Battery: 3.7V	
Low Power Mode(3.7V@2A)	/	Light-Sleep: ~9.96μA Deep-Sleep(System OFF): ~4.76μA Deep-Sleep(System OFF、GRTC wake-up): ~4.92μA Ship-Mode: 0.33μA
Software Compatibility	Nordic nRF Connect SDK	
	PlatformIO	
	Zephyr RTOS	
Working Temperature	-20°C to 70°C	
Dimensions	21 x 17.8mm	
Various Versions	XIAO nRF54LM20A Pre-soldered	XIAO nRF54LM20A Sense Pre-soldered

Hardware Overview



Applications

- **Wearable motion and activity tracking**
- **Battery-powered Bluetooth LE sensor nodes**
- **Smart home devices with Matter, Thread, Zigbee, or Bluetooth Mesh**
- **TinyML and edge AI sensing**
- **Audio event detection and voice-triggered devices**

Part List

Seeed Studio XIAO nRF54LM20A Sense	x1
7-Pin Header	x 2
2.4GHz FPC Antenna A-04	x 1

Compliance & Logistics



HSCODE	8543709990
USHSCODE	8517180050
UPC	
EUHSCODE	8543709099
COO	CHINA

FCC Requirement

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

15.21

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy.

If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Resource Links

- <https://www.seeedstudio.com/Seeed-Studio-XIAO-nRF54LM20A-Sense-p-6840.html>

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