

seeed studio

INDUSTRIAL PRODUCT DATASHEET

Seeed Studio XIAO SAMD21 Plus

Seeed Studio XIAO SAMD21 Plus is a thumb-sized ARM Cortex-M0+ development board with 16 additional SMD GPIOs and integrated Li-ion battery management for battery-powered IoT, wearables, embedded prototyping, and production...

SKU

100031394

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PRICE

\$5.90(Excl. VAT)



Overview



The Seeed Studio XIAO SAMD21 Plus upgrades the original thumb-sized XIAO SAMD21 with 16 additional SMD GPIOs, integrated Li-ion battery management, dedicated Reset and Boot buttons, and an onboard WS2812 RGB LED, powered by the Microchip ATSAMD21G18A ARM Cortex-M0+ processor at 48MHz. It maintains Arduino, PlatformIO, CircuitPython, and TinyGo compatibility, making it suitable for STEM education, USB HID devices, wearables, battery-powered IoT, robotics, and production-ready SoM designs.

Key Features

Note:

This product is the Seeed Studio XIAO SAMD21 Plus, the upgraded variant of XIAO SAMD21 with 16 additional SMD GPIOs and integrated Li-ion battery management. The board and two 7-pin headers are included. No battery, USB cable, or other accessories are included.

Overview

Following the XIAO Plus design language established by XIAO nRF52840 Plus, XIAO nRF52840 Sense Plus, XIAO ESP32-S3 Plus, and XIAO RP2040 Plus, the new Seeed Studio XIAO SAMD21 Plus upgrades the flagship XIAO SAMD21 — the original thumb-sized Arduino board — with expanded GPIO resources, integrated Li-ion battery management, enhanced user interaction features, and a standardized backside layout.

Powered by Microchip's SAMD21G18A ARM Cortex-M0+ 32-bit processor, XIAO SAMD21 Plus brings enhanced flexibility and expandability to the tiny and versatile XIAO SAMD21. While maintaining all the powerful features including Arduino, MicroPython, and PlatformIO compatibility, the Plus variant features redesigned castellations and backside pad layout, offering **16 additional GPIOs**, integrated Li-ion battery management, dedicated Reset and Boot buttons, and an onboard programmable WS2812 RGB LED. It is ideal for advanced IoT projects, battery-powered wearables, embedded applications, and production-ready SoM designs.

As an addition to the [Seeed Studio XIAO family](#), the XIAO SAMD21 Plus remains the classic XIAO design (thumb-size, SMD, stamp holes). All these features make it a perfect fit for either space-limited applications, or a production-ready System on Module (SoM) for your PCBA designs. Through our Fusion PCBA Sponsorship program, you can not only enjoy the lowest unit prices for all XIAO modules from [our Fusion](#) Open Parts Library, but also fabricate and scale your XIAO-based PCBA designs at low cost (30% off) with FREE Design for Manufacturing consulting services, streamlining your journey from prototype to production.

Note:

XIAO SoM User Manual open-sources all hardware and software materials of XIAO, providing professional product design guidelines to help you accelerate ideas off the ground, streamline product design, providing a seamless experience from module selection to mass production. You can check [here](#) to see more info.

- **High-Efficiency ARM Cortex-M0+ MCU**

Powered by the Microchip ATSAMD21G18A ARM Cortex-M0+ processor running at 48MHz, XIAO SAMD21 Plus delivers an excellent balance between computing performance and ultra-low power consumption. Native USB support enables USB HID devices, MIDI controllers, USB serial communication, and numerous embedded USB applications. Fully compatible with Arduino, PlatformIO, CircuitPython, TinyGo, and other popular development ecosystems, it is suitable for projects ranging from STEM education to commercial embedded products.

- **Multi-Language Development Ecosystem**

Start quickly with the Arduino IDE for rapid prototyping, develop efficiently with PlatformIO, or explore embedded scripting using CircuitPython and TinyGo. Backed by extensive community resources and comprehensive documentation, XIAO SAMD21 Plus provides a beginner-friendly experience while remaining flexible enough for professional development workflows.

- **Efficient Power Management**

An onboard PMIC enables direct Li-ion battery connection with integrated charging management and 3V3/BAT backflow protection. The board can safely operate from USB power, battery power, or both simultaneously without requiring additional external charging circuitry, simplifying portable and battery-powered product design.

The integrated Charge LED provides intuitive charging status indication, making battery management easier during both development and daily use.

- **Expanded I/O for Advanced Applications**

The redesigned backside layout introduces 16 additional GPIOs through 1.27mm-pitch SMD castellations, significantly expanding the available I/O resources while preserving the compact XIAO footprint.

These additional GPIOs allow developers to connect more sensors, peripherals, displays, and communication interfaces without relying on external GPIO expanders, making XIAO SAMD21 Plus especially suitable for custom carrier boards, advanced embedded applications, and production-ready System-on-Module (SoM) designs.

- **Universal Compatibility — Standardized Backside Layout**

Following the unified XIAO Plus hardware standard, XIAO SAMD21 Plus adopts the standardized backside layout with aligned battery pads, debugger pads, and SMD castellations.

This standardized design ensures compatibility with current and future XIAO expansion boards, accessories, and custom carrier boards, allowing developers to migrate between different XIAO Plus modules with minimal hardware redesign.

- **Classic XIAO Form Factor**

Despite the significant hardware upgrades, XIAO SAMD21 Plus retains the iconic 21 × 17.8 mm thumb-sized footprint and the familiar 2.54mm pin header layout.

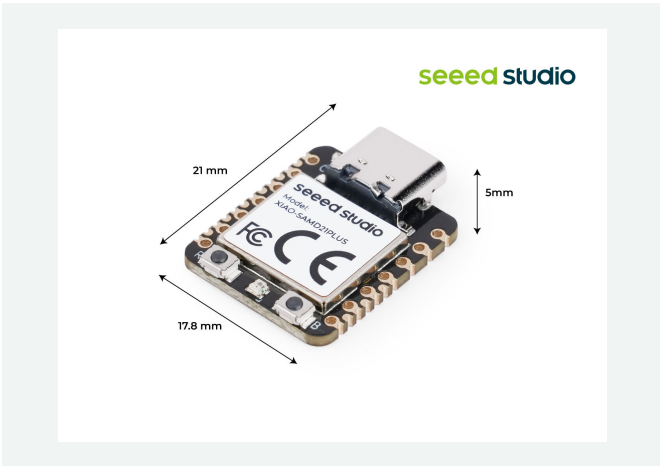
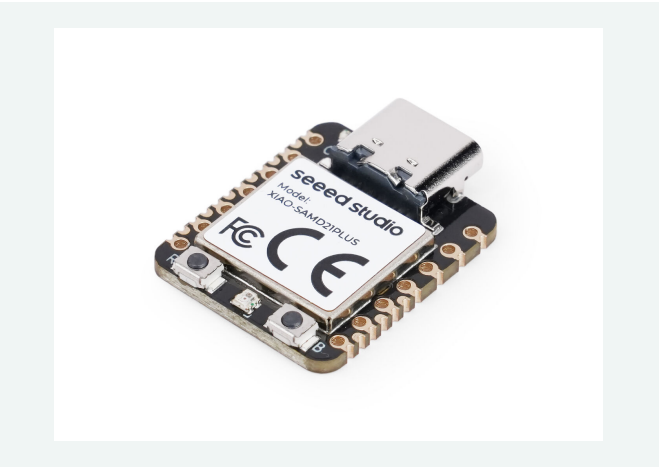
Its compact size, lightweight design, and single-sided component placement make it ideal for wearable electronics, portable devices, robotics, sensor nodes, and space-constrained embedded applications.

- **Native Compatibility with the XIAO Ecosystem**

XIAO SAMD21 Plus is fully compatible with the growing XIAO accessory ecosystem, including expansion boards, displays, Grove modules, CAN Bus modules, LoRa modules, LED Matrix, Round Display, Vision AI Sensor, ePaper Displays, mmWave sensors, GPS modules, relay modules, Bus Servo Drivers, and many more.

With standardized hardware interfaces across the XIAO family, developers can rapidly prototype ideas while benefiting from an extensive ecosystem that supports applications ranging from education to industrial IoT.

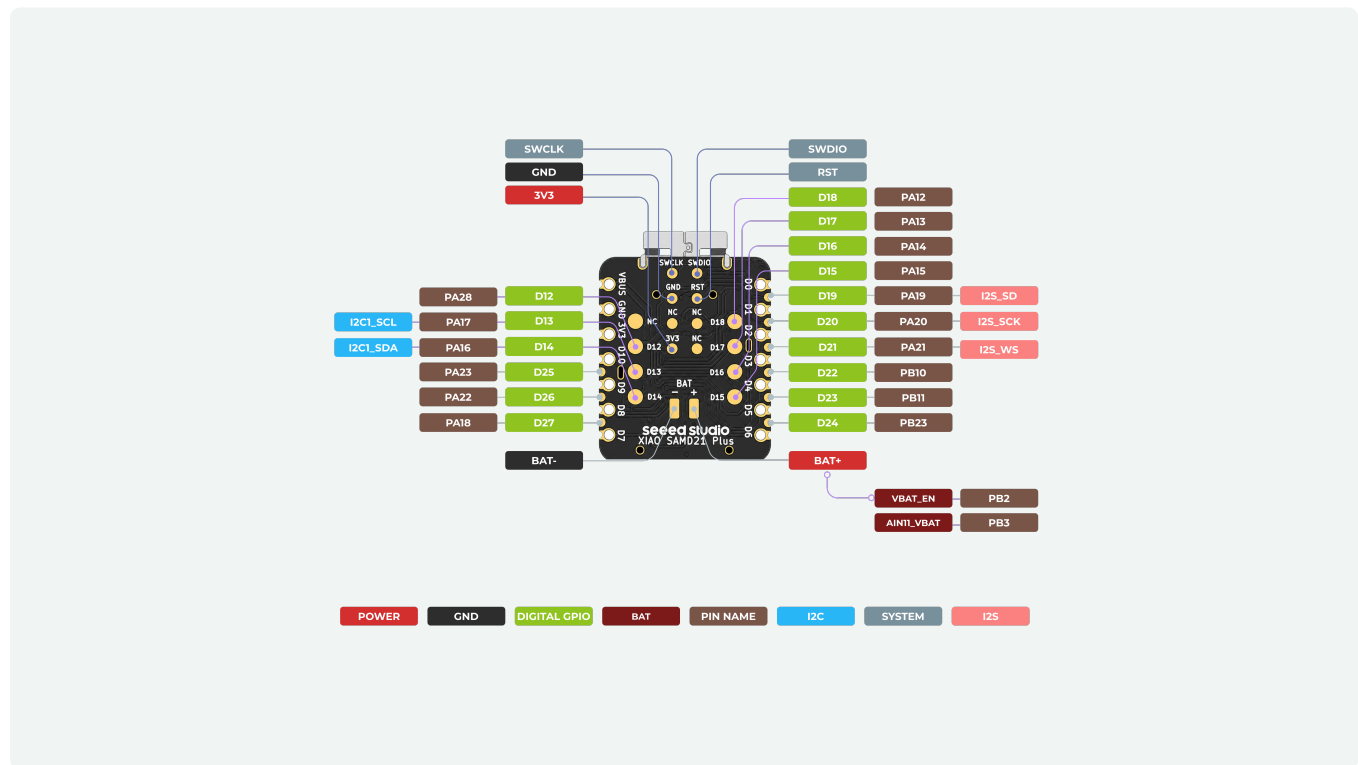
Product Gallery



Specification

Product Name	Seeed Studio XIAO SAMD21	Seeed Studio XIAO SAMD21 Plus
Chipset	Microchip SAMD21G18	
Processor	ARM Cortex-M0+ processor runs at up to 48MHz.	

RAM	32KB SRAM	
Flash	256KB Flash	
Interface	GPIO Pin x14 Digital Pin x11 Analog Pin x11 DAC x1 I2C x1 UART x1 SPI x1	GPIO Pin x30 Digital Pin x27 Analog Pin x11 DAC x1 I2C x2 UART x1 SPI x1 I2S x1
Onboard	User LED x1 Power LED x1 Status LEDs for Serial Communication (TX/RX Indicators) x2	RGB LED x1 Charge LED x1 Reset Button x1 Boot Button x1
Battery Management (PMIC)	None	Onboard PMIC
Power	Input Voltage (Type-C): 5V Input Voltage (BAT): 5V	
BAT-to-3V3 Backflow Protection	No	Yes
Working Temperature	-40°C ~ 85°C	
Dimensions	21 x 17.8mm	
Software Compatibility	Arduino, PlatformIO, MicroPython, CircuitPython, Zephyr, and more to come	
Variants	• XIAO SAMD21 (Pre-Soldered) • XIAO SAMD21 3PCS Pack	



Applications

- **STEM Education:** Perfect for learning embedded programming, Arduino development, electronics, and ARM Cortex-M microcontrollers. Rich documentation and native USB support make it an excellent platform for beginners and educators.
- **USB HID Devices:** Leverage the ATSAMD21 native USB peripheral to create custom keyboards, macro pads, game controllers, MIDI instruments, USB serial devices, and other Human Interface Device (HID) applications.
- **Wearable Electronics:** The compact 21 × 17.8 mm footprint, onboard battery charging, and low-power MCU make XIAO SAMD21 Plus an excellent choice for smart badges, wearable sensors, health monitoring devices, and portable electronics.
- **Embedded Prototyping:** With 16 additional GPIOs, developers can integrate more peripherals without external GPIO expanders, enabling faster prototyping of complex embedded systems while maintaining the familiar XIAO form factor.
- **Smart Home & Automation:** Connect multiple Grove modules, displays, communication modules, and sensors to build automation controllers, environmental monitoring stations, lighting controllers, and edge computing devices.
- **Robotics:** Suitable for educational robots, motor controllers, sensor hubs, and compact robotic platforms requiring reliable low-power control and flexible I/O expansion.
- **Human-Machine Interface (HMI):** The onboard WS2812 RGB LED together with dedicated Reset and Boot buttons provides convenient visual feedback and user interaction, making XIAO SAMD21 Plus well suited for compact control panels, interactive devices, and embedded user interfaces.
- **Battery-Powered IoT:** The integrated PMIC and Li-ion charging circuit simplify the design of portable IoT devices, wireless sensor nodes, environmental monitoring systems, and remote data loggers.
- **Production-Ready SoM Design:** Designed for board-to-board soldering through castellated edges, XIAO SAMD21 Plus serves as a production-ready System-on-Module (SoM). The additional GPIOs and standardized XIAO Plus layout simplify hardware migration from prototype to mass production.

Part List

Seeed Studio XIAO SAMD21 Plus	x1
7-pin header	x2

Compliance & Logistics



HSCODE	8471504090
USHSCODE	8517180050
UPC	
EUHSCODE	8471707000
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-SAMD21-Plus-p-6933.html>
- [Wiki-XIAO SAMD21 Plus Resources](#)
- [Seeed Studio XIAO Use Case](#)
- [3D Printing "Case" Studies](#)

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