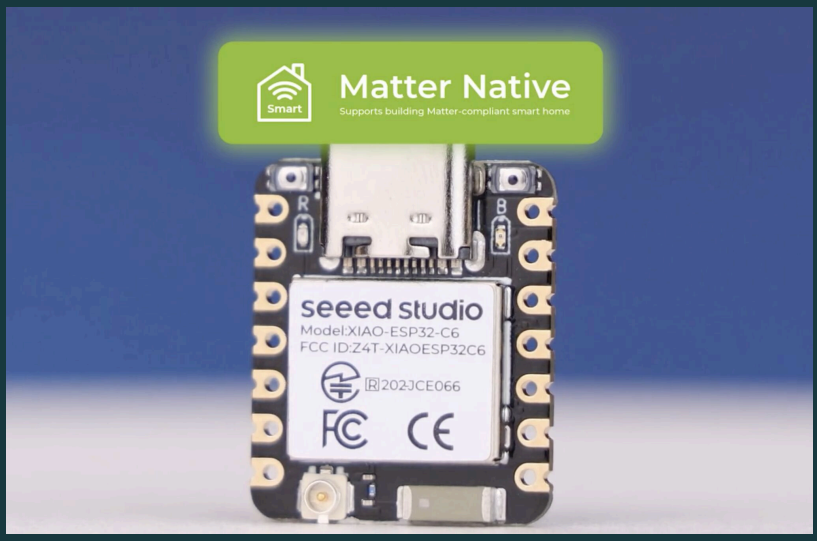
seeed studio

INDUSTRIAL PRODUCT DATASHEET

Seeed Studio XIAO ESP32-C6

The Seeed Studio XIAO ESP32-C6 combines Wi-Fi 6, Bluetooth 5, Thread, Zigbee, and Matter support with advanced security and ultra-low power in a compact form factor for smart home and wearable IoT applications.

SKU	UPDATED	PRICE
113991254	2026-06-29 03:32:29	$5.20(Excl. VAT)



Overview

The Seeed Studio XIAO ESP32-C6 is a thumb-sized (21 x 17.8mm) microcontroller module featuring 2.4GHz Wi-Fi 6, Bluetooth 5 (LE), and IEEE 802.15.4 (Thread/Zigbee) connectivity with dual RISC-V processors and on-chip security (secure boot, encryption, TEE). It is ideal for secure and connected smart home, space-limited wearable, and wireless IoT applications, offering Matter compatibility and low power consumption down to 15 µA in deep sleep.

Key Features

- **Enhanced Connectivity**: Combines 2.4GHz Wi-Fi 6 (802.11ax), Bluetooth 5(LE), and IEEE 802.15.4 radio connectivity, allowing you to apply the Thread and Zigbee protocols.
- **Matter Native:** Supports building Matter-compliant smart home projects thanks to its enhanced connectivity, achieving interoperability
- **Security Encrypted on Chip:** Powered by **ESP32-C6**, it brings enhanced encrypted-on-chip security to your smart home projects via secure boot, encryption, and Trusted Execution Environment (TEE)
- **Outstanding RF performance:** Has an on-board antenna with up to 80m BLE/Wi-Fi range, while reserving an interface for external UFL antenna
- **Leveraging Power Consumption:** Comes with four working modes, with the lowest being 15 μA in deep sleep mode, while also supporting lithium battery charge management.
- **Dual RISC-V Processors:** Incorporates two 32-bit RISC-V processors, with the high-performance processor running up to 160 MHz, and the low-power processor clocking up to 20 MHz
- **Classic XIAO Designs:** Remains the classic XIAO designs of the thumb-size form factor of 21 x 17.8mm, and single-sided mount, making it perfect for space-limited projects such as wearables
- **Seamless integration with mainstream Cloud Platforms:** ESP Rain Maker, AWS IoT, Microsoft Azure, and Google Cloud

Production-Ready Design with Fusion PCBA Support

Being the 8th member of the **Seeed Studio XIAO family**, XIAO ESP32C6 remains the classic XIAO design. All these features make it a perfect fit for either space-limited projects such as wearables, or a production-ready unit 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.

Starter Kit with free Course for all Electronics Neophytes and Enthusiasts

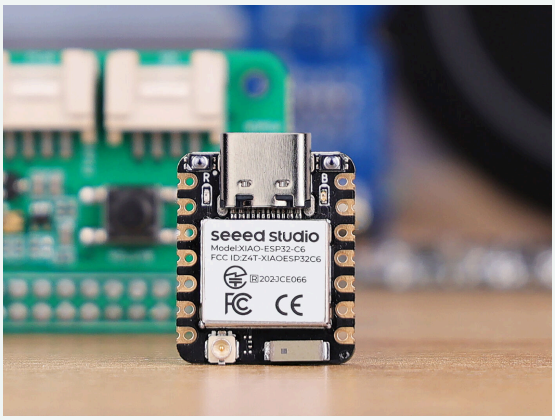
Seeed Studio has provided the **Grove Starter Kit** along with **free and detailed courses** for you quickly get started with microcontrollers and electronics, regarding all the Seeed Studio XIAO boards, promising you a great learning experience.

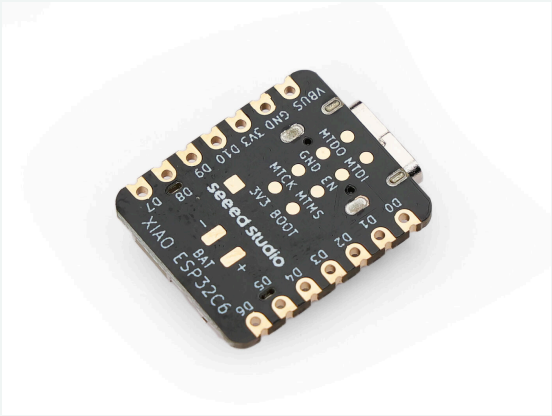
Not only programming but also electronics knowledge is not required, you will be taken step by step, from **understanding the basic concepts to exercising the simple projects individually**, finally being able to **build complex, interesting, wearable projects** on your own, owing a **practical electronic product prototype** from the course.

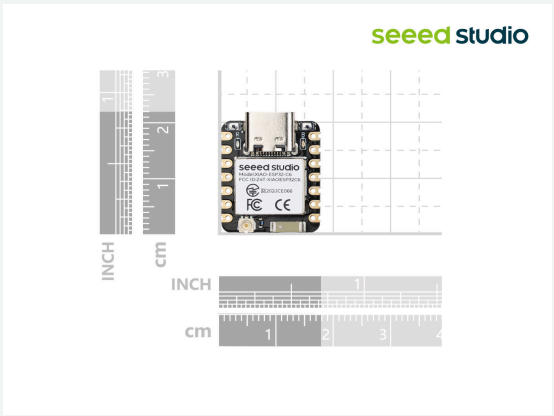
You can have access to the **Seeed Studio Grove ecosystem** by connecting it to the compatible **Seeed Studio XIAO expansion board**. We have developed more than **400 Grove modules**, covering a wide range of applications that can fulfill various needs. For example, you can make a **BLE AI-driven Smartwatch Detecting Potential Sun Damage** by connecting the Seeed Studio XIAO nRF52840 with an **expansion board**, and a **Grove - UV Sensor**. Get started and explore the infinite possibilities of the Seeed Studio XIAO series!

If you are interested in programming embedded machine learning, we have **Codecraft** visual programming that can help you quickly start your own TinyML project. And we have set up a **#tinyml** channel on our Discord server, please click to join for 24/7 making, sharing, discussing, and helping each other out.

Product Gallery



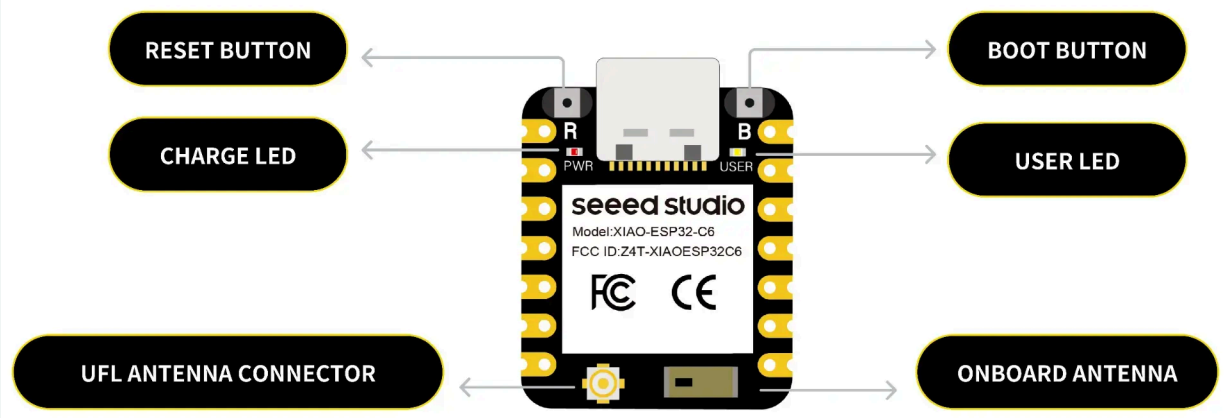


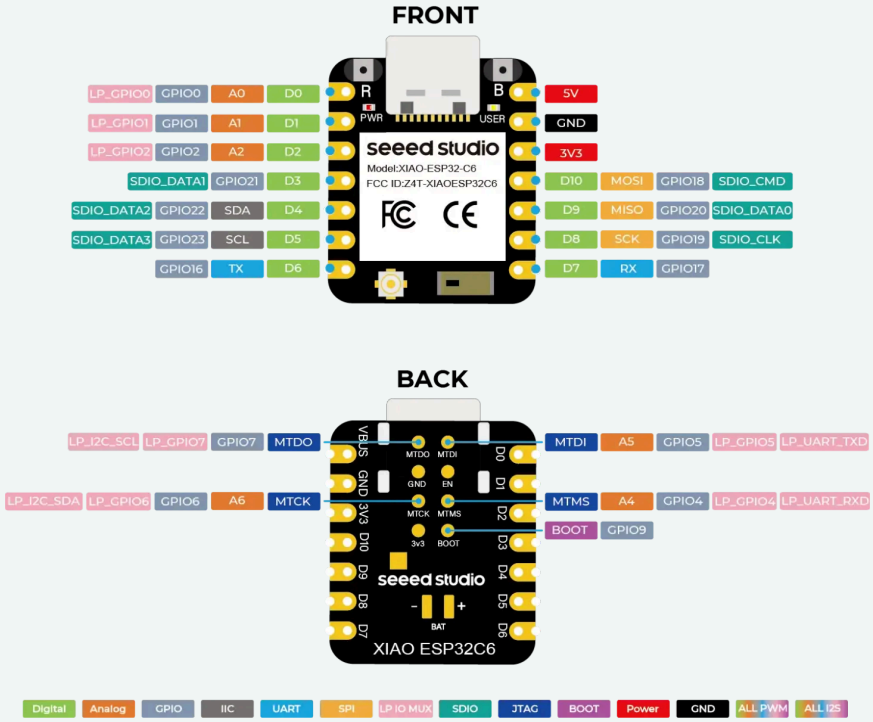


Specification

Product	XIAO ESP32-C6	XIAO ESP32-C3	XIAO ESP32-S3
Processor	Espressif ESP32-C6 SoC	Espressif ESP32-C3 SoC	Espressif ESP32-S3R8 SoC
	two 32-bit RISC-V processors, with the high-performance one running up to 160 MHz, and the low-power one clocking up to 20 MHz	RISC-V single-core 32-bit chip processor with a four-stage pipeline that operates at up to 160 MHz	Xtensa LX7 dual-core, 32-bit processor running up to 240 MHz
Wireless	Complete 2.4GHz Wi-Fi 6 subsystem	Complete 2.4GHz Wi-Fi subsystem	Complete 2.4GHz Wi-Fi subsystem
	Bluetooth Low Energy 5.0		
	Zigbee,Thread,IEEE 802.15.4	/	/
On-chip Memory	512KB SRAM & 4MB Flash	400KB SRAM & 4MB Flash	8MB PSRAM & 8MB Flash
Interface	1x UART 1x LP_UART 1x IIC 1x LP_IIC 1x SPI 11x GPIO(PWM) 7x ADC 1xSDIO	1x UART 1x IIC 1x SPI 11x GPIO(PWM) 4x ADC	1x UART 1x IIC 1x SPI 11x GPIO(PWM) 9x ADC 1x User LED 1x Charge LED
	1x Reset button 1x Boot button		
Dimensions	21 x 17.8mm		
Power	Input voltage (Type-C): 5V Input voltage (BAT): 3.7V		
Power Consumption Model (Typ.) (Supply Power: 3.8V)	Modem-sleep Model: 30 mA Light-sleep Model: 3.1 mA Deep Sleep Model: 15 μA	Modem-sleep Model: 24 mA Light-sleep Model: 3 mA Deep Sleep Model: 44 μA	Modem-sleep Model: 27 mA Light-sleep Model: 2 mA Deep Sleep Model: 14 μA
Working Temperature	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 65°C

Hardware Overview





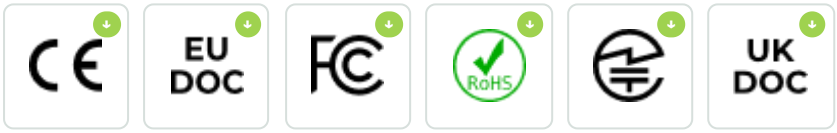
Applications

- **Secure and Connected Smart Home:** enhancing everyday life through automation, remote control, and more
- **Space-limited and Battery-Powered Wearables:** thanks to their thumb-size and low-power consumption
- **Wireless IoT Scenarios:** enabling rapid, reliable data transmission

Part List

Seeed Studio XIAO ESP32C6	x1
7 Pin Header	x2

Compliance & Logistics



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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-ESP32C6-p-5884.html
- PCN-XIAO Series Packaging Upgrade.pdf
- Wiki-XIAO ESP32-C6 Resources
- Seeed Studio XIAO Use Case

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