

seeed studio

INDUSTRIAL PRODUCT DATASHEET

Seeed Studio XIAO ESP32-C3

A thumb-sized, production-ready ESP32-C3 board with Wi-Fi, BLE, and ultra-low-power modes for wearables and IoT applications.

SKU

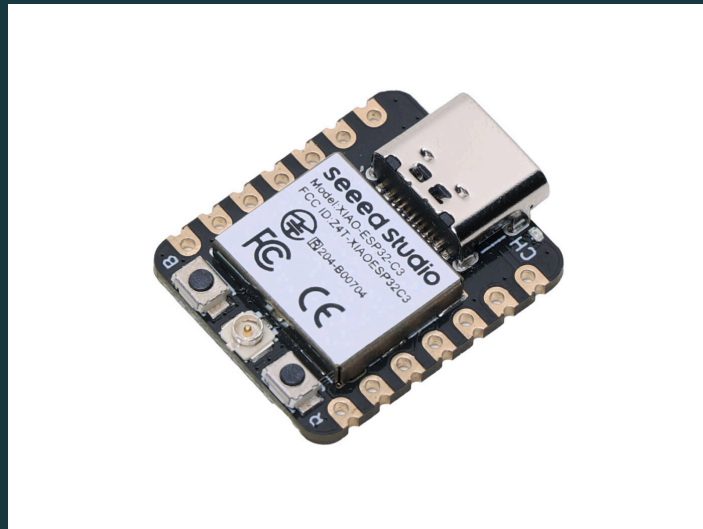
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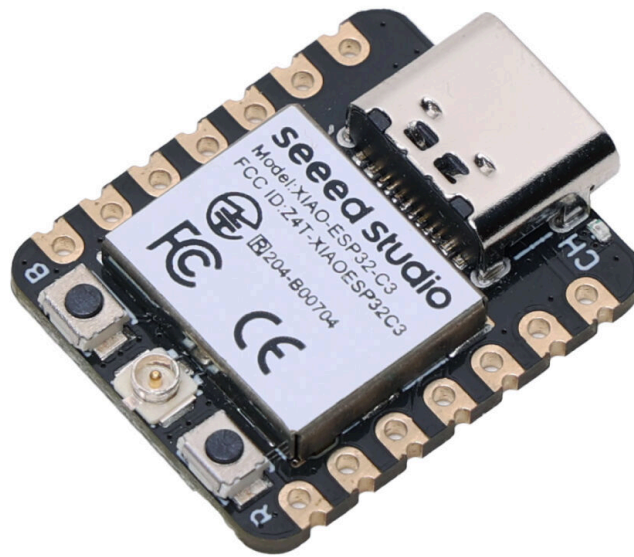
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PRICE

\$4.90(Excl. VAT)



Overview



The Seeed Studio XIAO ESP32-C3 is a thumb-sized (21 x 17.8mm) IoT board built on the ESP32-C3 RISC-V chip, delivering Wi-Fi, Bluetooth LE, and ultra-low-power operation with deep sleep at just 44 μ A. Its SMD and breadboard-friendly design, combined with Seeed's Fusion PCBA support, makes it a production-ready solution for wearable, health monitoring, and rapid prototyping applications.

Key Features

- **Flexible MCU Board:** Incorporate the **ESP32-C3** 32-bit RISC-V chip, operating up to 160 MHz, mounted multiple development ports, supported by Arduino / CircuitPython
- **Outstanding RF performance:** Implement complete Wi-Fi functions and Bluetooth Low Energy, while supporting communication over 100m with a U.FL antenna
- **Elaborate Power Design:** Provide 4 working modes as low as 44 μ A in deep sleep mode, while supporting lithium battery charge management
- **Thumb-sized Design:** 21 x 17.8mm, Seeed Studio XIAO series classic form factor and elegant productization of single-sided components mounting, suitable for wearable devices
- **Perfect for Production:** Breadboard-friendly & SMD design, no components on the back

Production-Ready Design with Fusion PCBA Support

All Seeed Studio XIAO dev boards feature a production-optimized SMD (Surface Mount Device) design with standardized stamp holes, making it perfect for commercial PCBA (Printed Circuit Board Assembly) integration. 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.

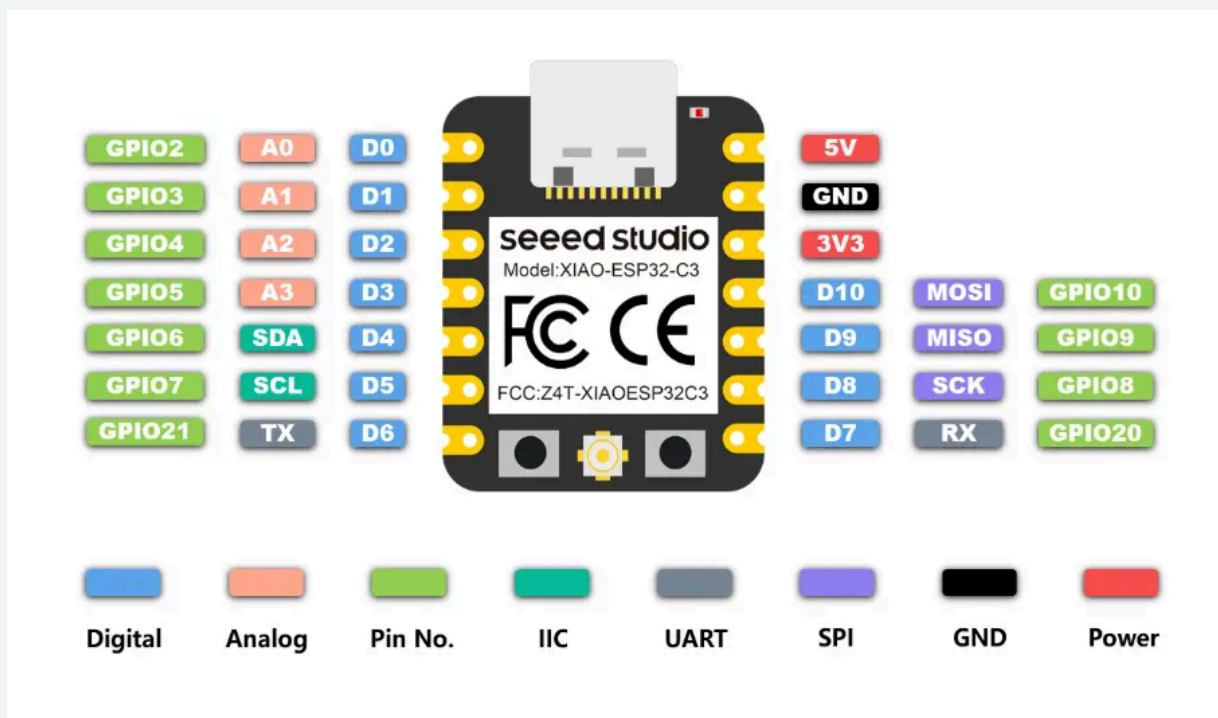
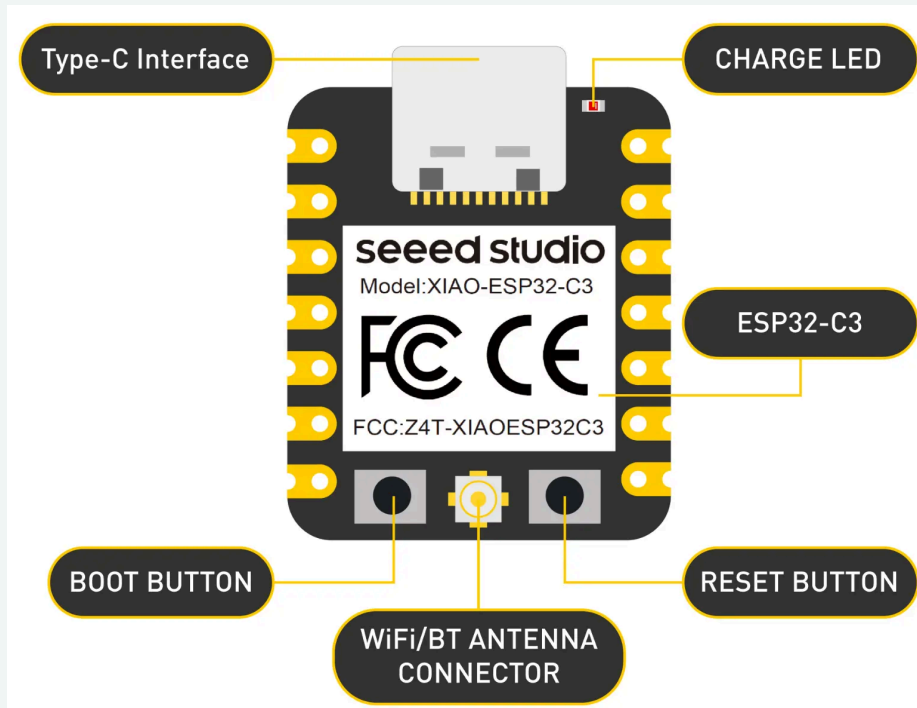
You can have access to the **Seeed Studio Grove ecosystem** by connecting it to the compatible **Seeed Studio XIAO expansion board**. We have developed more than **400 Grove modules**, covering a wide range of applications that can fulfill various needs. Get started and explore the infinite possibilities 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.

We already have 15 XIAO products based on different solutions in the XIAO family, to help you better understand the differences and choose the most suitable part for your projects, please refer to the **Seeed Studio XIAO Series Page**.

Wireless	Complete 2.4GHz Wi-Fi subsystem
	Bluetooth Low Energy 5.0/ Bluetooth Mesh
On-chip Memory	400KB SRAM & 4MB Flash
Interface	1x UART 1x IIC 1x SPI 11x GPIO(PWM) 4x ADC
	1x Reset button 1x Boot button
Dimensions	21 x 17.8mm
Power(Typ.)	Max 3.3V Output Current: 500mA Test Condition: BAT Pin Input @ 3.8V Source Capability: 3A
	Charging current: 380mA(Fast) / 40mA(Trickle)
	Input voltage (VIN): 5V Input voltage (BAT): 3.7V
Deep Sleep Power Consumption	Deep Sleep Mode: 44 μ A
Wi-Fi Enabled Power Consumption	Active Mode: 75 mA
	Modem-sleep Mode: 25 mA
	Light-sleep Mode: 4 mA
BLE Enabled Power Consumption	Modem-sleep Mode: 27 mA
	Light-sleep Mode: 10 mA
Working Temperature	-40°C ~ 85°C

Hardware Overview



Applications

- **Internet of Things**
- **Wearable devices**
- **Health monitoring**
- **Education**
- **Low-Power(LP) networking**
- **Rapid prototyping**
- **Smart Private Garage:** This is a peer-to-peer WiFi communication application, since two XIAOs detect each other via Wifi, the garage door will open or keep opening, and vice versa. Improvement: It is nice to add an ultrasonic distance sensor to measure the car-to-door distance and an OLED screen to check the status of the garage. If you want an onboard voice sensor to command the door to open with vocal instruction, try our XIAO BLE Sense.
- **Remote Forest Tracker:** Thanks to the tiny size of the XIAO series, it is suitable to make the wearable devices, such as a small pet trackers. This wearable device can be used as a simple GPS-Tracker which will lock its current location and publish other data via LoRa. Improvement: A compass that shows direction and distance is a great added value to the tracker that you could consider. Meanwhile, publishing altitude, speed, or other parameters could bring more scenarios to this tracker. Besides, the chip ESP32-C3 allows this tracker to communicate over WiFi or BLE, and therefore, we can upload the tracker's data or realize the Long Range-to-MQTT bridge as well. Probably you are worried about the wireless capability of the above application of XIAO ESP32-C3, and We have a 2.4GHz Rod Antenna for XIAO ESP32-C3 which increases the wireless capability of the XIAO ESP32-C3, The antenna is certified TELEC and XIAO ESP32C3 is compatible with Antenna, Check 2.4GHz 2.81dBi Antenna for XIAO ESP32C3 - Seeed Studio to see more!

Part List

Seeed Studio XIAO ESP32-C3	x1
Antenna	x1
7 Pin Header	x2

Compliance & Logistics



HSCODE	8517180050
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-XIAO-ESP32C3-p-5431.html>
- [3D Printing "Case" Studies](#)
- [PCN-XIAO Series Packaging Upgrade.pdf](#)
- [Wiki-XIAO ESP32-C3 Resources](#)
- [Report of XIAO ESP32-C3 Low Power Consumption](#)
- [Seeed Studio XIAO Use Case](#)

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