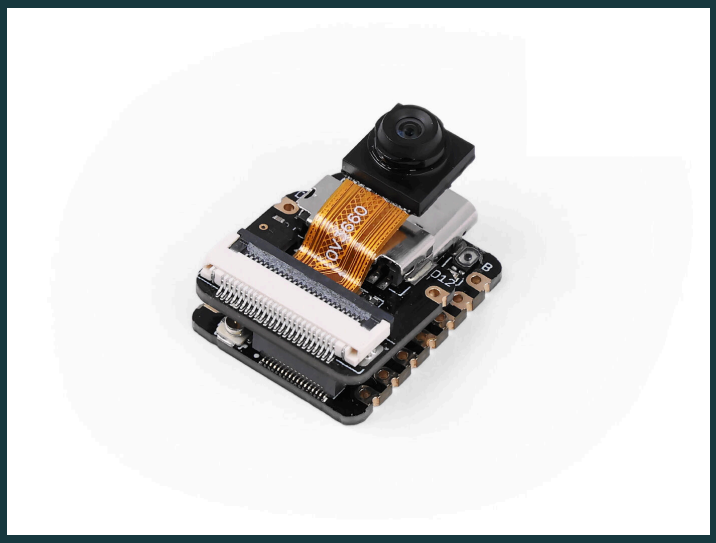
seeed studio

INDUSTRIAL PRODUCT DATASHEET

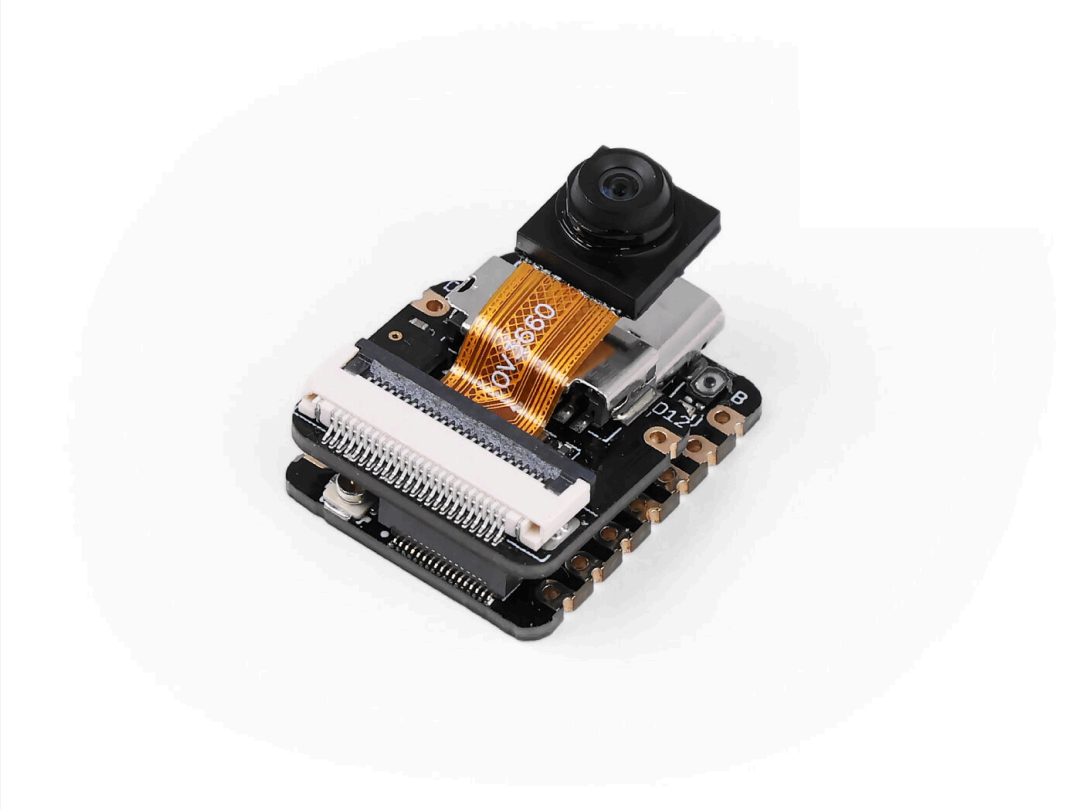
Seeed Studio XIAO ESP32-S3 Sense

Thumb-sized ESP32-S3 development board with detachable OV5640/OV3660 camera, digital microphone, 8MB PSRAM/FLASH, Wi-Fi/BLE, and SenseCraft AI for no-code vision and audio deployment.

SKU	UPDATED	PRICE
113991115	2026-10-23 05:36:49	$13.90(Excl. VAT)



Overview



The Seeed Studio XIAO ESP32-S3 Sense is a thumb-sized 21 x 17.8mm board powered by the ESP32-S3 dual-core Xtensa processor up to 240 MHz, with 8MB PSRAM, 8MB FLASH, SD card slot, 2.4GHz Wi-Fi, and BLE. It integrates a detachable OV5640/OV3660 camera sensor and digital microphone, supports Arduino/MicroPython and SenseCraft AI for no-code vision and audio model deployment, and suits applications including image processing, speech recognition, video monitoring, wearables, smart homes, health monitoring, education, and rapid prototyping.

Key Features

Note:

- The XIAO ESP32-S3 Sense now features the **OV5640** camera sensor with autofocus. During the transition period, units may ship with either the **OV5640 or OV3660** sensor.

- **Powerful MCU Board:** Incorporate the ESP32-S3 32-bit, dual-core, Xtensa processor chip operating up to 240 MHz, mounted multiple development ports, Arduino / MicroPython supported
- **Advanced Functionality:** Detachable OV3660 camera sensor for 2048*1536 resolution, compatible with OV5640 camera sensor, integrating additional digital microphone
- **Great Memory for more Possibilities:** Offer 8MB PSRAM and 8MB FLASH, supporting SD card slot for external 32GB FAT memory
- **Outstanding RF performance:** Support 2.4GHz Wi-Fi and BLE dual wireless communication, support 100m+ remote communication when connected with U.FL antenna
- **Thumb-sized Compact Design:** 21 x 17.8mm, adopting the classic form factor of XIAO, suitable for space-limited projects like wearable devices
- **Pre-trained AI models from SenseCraft AI for no-code deployment**

SenseCraft AI lets you train and deploy vision and audio AI models to XIAO ESP32S3 Sense without coding. Use ready-made models or create your own, deploy from the browser, and preview results in real time. It is suitable for people detection, security monitoring, object recognition, gesture control, sound detection, and other smart sensing projects.
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. With our Seeed Studio Fusion services, you can access competitive **one-stop PCBA manufacturing, component sourcing, and testing, plus free DFA/DFM review** to reduce manufacturing risks and accelerate the 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.

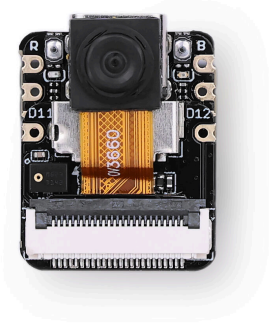
You can have access to the **Seeed Studio Grove ecosystem** by connecting it to the compatible **Seeed Studio XIAO expansion board**. We have developed more than **400 Grove modules**, covering a wide range of applications that can fulfill various needs. Get started and explore the infinite possibilities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

Product Gallery



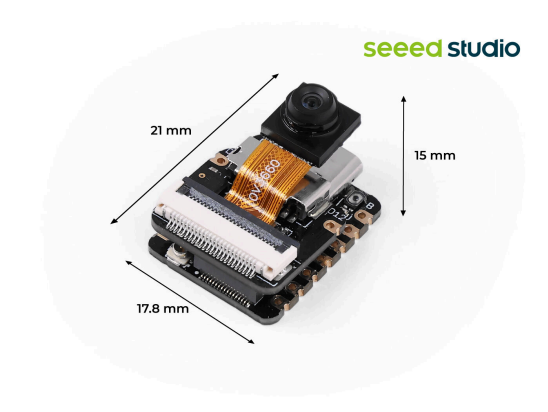












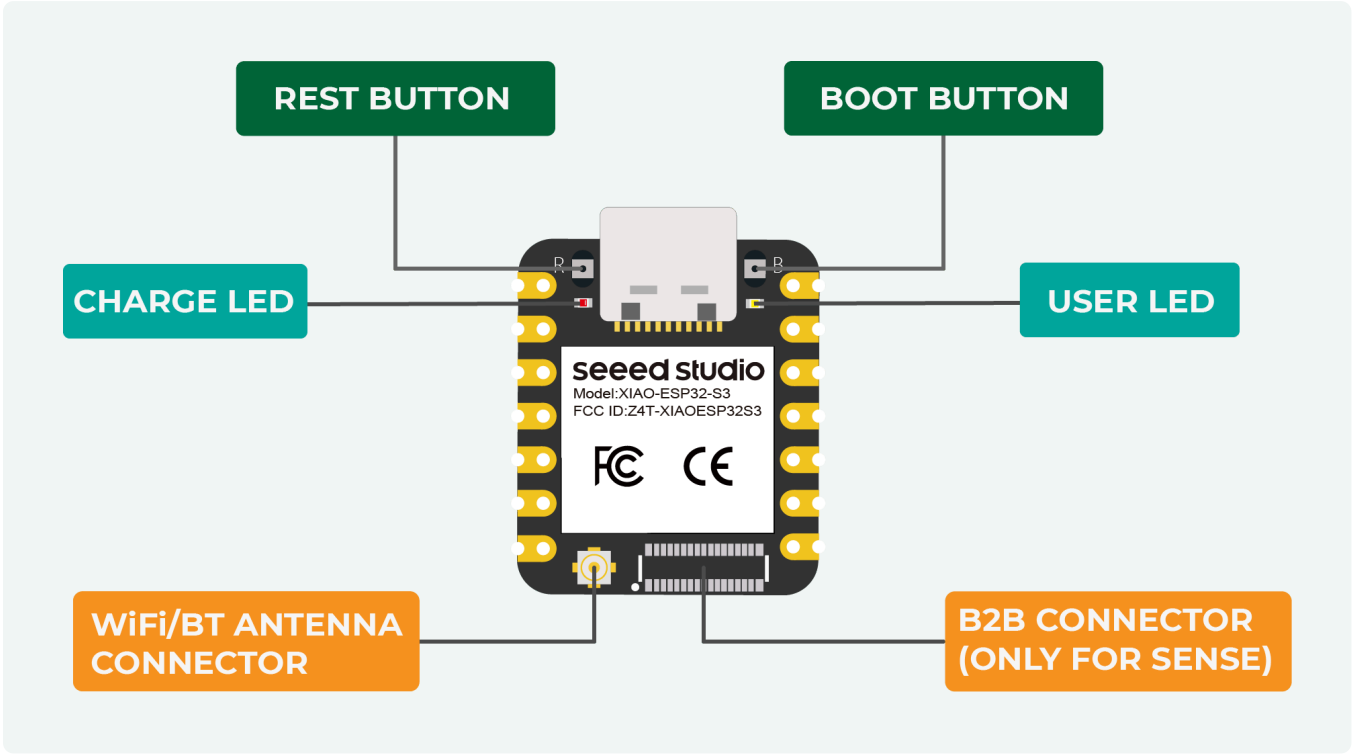


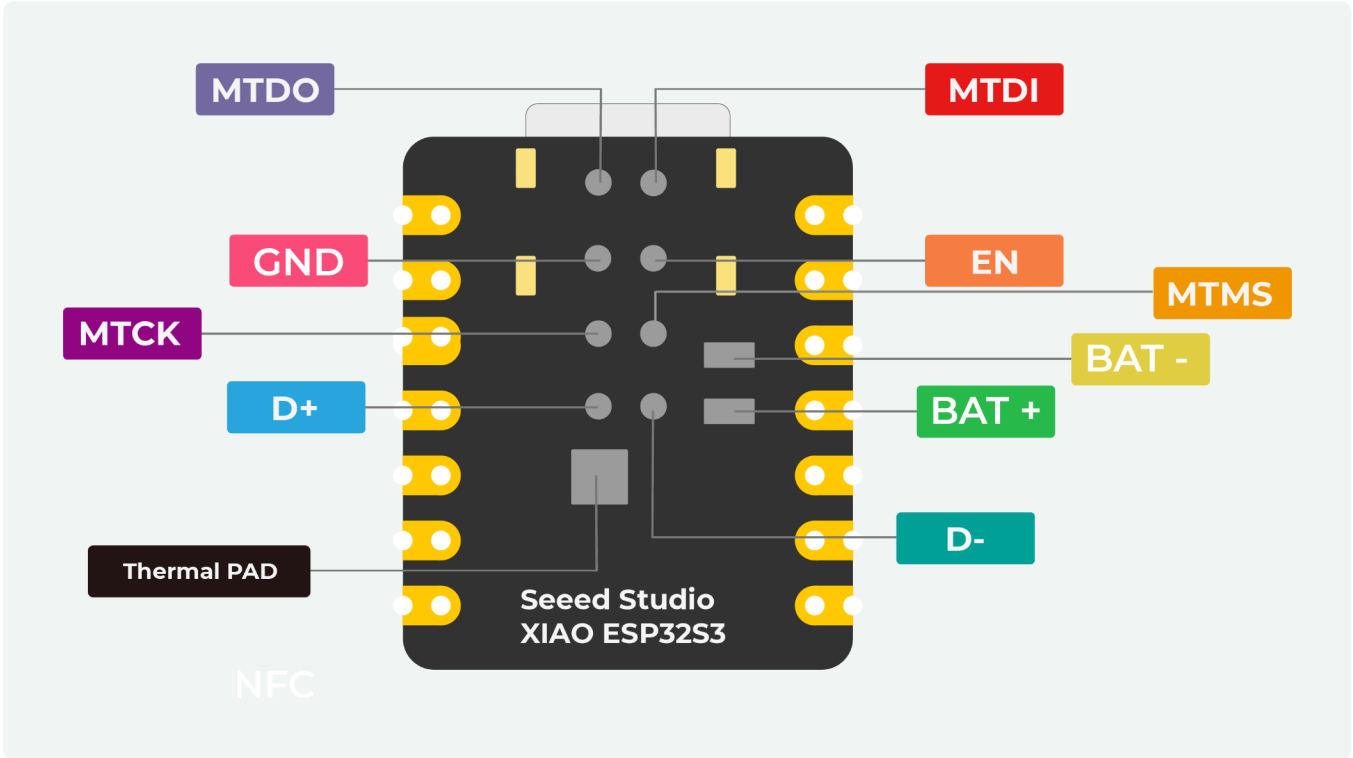
Specification

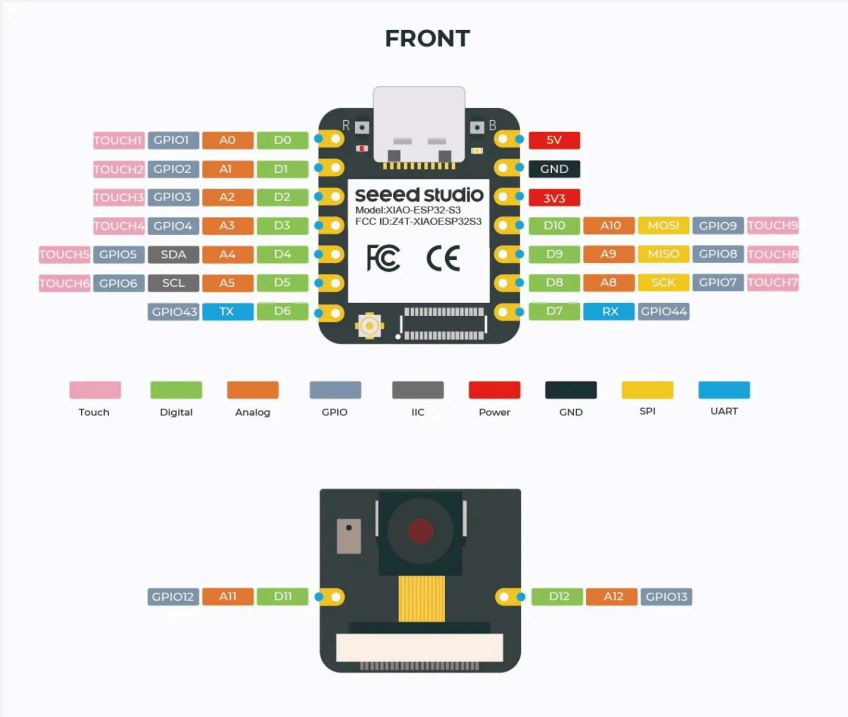
Product	Seeed Studio XIAO ESP32-S3	Seeed Studio XIAO ESP32-S3 Sense
Processor	ESP32-S3R8 Xtensa LX7 dual-core,32-bit processor that operates at up to 240 MHZ	
Wireless	Complete 2.4GHz Wi-Fi subsystem Bluetooth Low Energy 5.0 / Bluetooth Mesh	
Built-in Sensors	/	1x OV5640 camera sensor 1x Digital Microphone
Memory	On-chip 8MB PSRAM & 8MB Flash	On-chip 8MB PSRAM & 8MB Flash Onboard SD Card Slot, supporting 32GB FAT
Interface	1x UART 1x IIC 1x SPI 11x GPIO(PWM) 9x ADC 1x User LED 1x Charge LED 1x Reset button 1x Boot button	1x UART 1x IIC 1x IIS 1x SPI 11x GPIOs (PWM) 9x ADC 1x User LED 1x Charge LED 1x B2B Connector(with 2 additional GPIOs) 1x Reset button 1x Boot button
Dimensions	21 x 17.8mm	21 x 17.8 x 15mm (with expansion board)

Power(Typ.)	Input voltage (Type-C): 5V Input voltage (BAT): 3.7V	
	Circuit operating Voltage: - Type-C:5V@19mA - BAT: 3.8V@22mA	Circuit operating Voltage: -Type-C: 5V@38.3mA - BAT: 3.8V@43.2mA (with expansion board)
	/	Webcam Web application: - Type-C: - - Average power Consumption: 5V/~140mA - - Peak power consumption(Image Capture): 5V/~347mA - Battery: - - Average power Consumption: 3.8V/~155mA - - Peak power consumption(Image Capture): 3.8V/~366mA
	/	Microphone recording & SD card writing: - Type-C: - - Average power consumption: 5V/54.58mA - - Peak power consumption: 5V/86.7mA - Battery: - - Average power consumption: 3.8V/64.5mA - - Peak power consumption: 3.8V/109.3mA
	50mA(Fast) / 3.8mA(Trickle)	
Low Power Consumption Model(Typ.) (Supply Power: 3.8V)	Modem-sleep Mode: 27mA Light-sleep Mode: 2mA Deep Sleep Mode: 14μA	Modem-sleep Mode: 44mA Light-sleep Mode: 5mA Deep Sleep Mode: 3mA
Wi-Fi Enabled Power Consumption(Typ.)	Active Mode: 100 mA	Active Mode: 110 mA (with expansion board)
BLE Enabled Power Consumption(Typ.)	Active Mode: 85 mA	Active Mode: 102 mA (with expansion board)
Working Temperature	-20°C ~65°C	

Hardware Overview







Applications

- **Image processing**
- **Speech Recognition**
- **Video Monitoring**
- **Wearable devices**
- **Smart Homes**
- **Health monitoring**
- **Education**
- **Low-Power(LP) networking**
- **Rapid prototyping**

Part List

XIAO ESP32-S3	x1
Plug-in camera sensor board	x1
Aluminum Heat Sink For XIAO	x2
7 Pin Header	x2
Antenna	x1

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/XIAO-ESP32S3-Sense-p-5639.html
- TinyML Case Studies
- 3D Printing "Case" Studies
- PCN-XIAO Series Packaging Upgrade.pdf
- PCN XIAO ESP32-S3 Sense Series Camera Upgrade
- Wiki-XIAO ESP32-S3 Series Resources
- Seeed Studio XIAO Use Case

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