seeed studio

INDUSTRIAL PRODUCT DATASHEET

reSpeaker XMOS XVF3800 with XIAO ESP32S3 (Case Version)– AI-powered 4-Mic Array for Clear Voice Even in Noise

AI-powered 4-mic array delivering clear far-field voice capture in noisy environments with USB and I2S connectivity for smart voice, robotics, and conferencing applications.

SKU	UPDATED	PRICE
114993702	2026-09-20 06:37:21	$64.90(Excl. VAT)

Overview

The reSpeaker XMOS XVF3800 with XIAO ESP32S3 (Case Version) is a professional 4-microphone array with advanced AI acoustic processing including AEC, beamforming, de-reverberation, DoA, noise suppression, and 60dB AGC for clear far-field voice capture up to 5 meters. It supports plug-and-play USB audio, I2S MCU integration, and compact embedded deployment for smart home, robotics, AI voice agent, and conferencing applications.

Key Features

Note:

- The reSpeaker XVF3800 with no XIAO versions (**101991441**, **114993701**) come with factory-installed **USB audio firmware**.
- The reSpeaker XVF3800 with XIAO ESP32S3 versions (**114993700**, **114993702**) come with factory-installed **I2S firmware** for MCU integration.
- All 4 versions support **DFU mode** for users to switch the firmware.

A professional 4-mic array solution with advanced AI acoustic processing, far-field voice capture, and flexible platform compatibility for next-generation voice AI applications. Powered by **AEC, beamforming, de-reverberation, DoA, noise suppression, and 60dB AGC** for clear and reliable voice capture.

Feature 1: Clear Voice Input Needs Professional Audio Processing

Smarter on-board AI acoustic algorithms for better sound quality. Features **AEC**, **multi-beamforming**, **de-reverberation**, **DoA**, **dynamic noise suppression**, **60dB AGC**, delivering stable and reliable voice capture performance.

Struggling with these voice interaction challenges?
- Voice recognition becomes unreliable in noisy environments?
- Audio playback causes echo and disrupts voice interaction?
- Voice input levels vary when users speak from longer or different distances?

reSpeaker XVF3800 is designed to solve these challenges with professional-grade voice front-end processing.

AEC

Acoustic Echo Cancellation

Eliminate echo during simultaneous playback and recording

Removes acoustic echo caused by speaker playback being captured by the microphone array, enabling natural full-duplex interaction for voice assistants, conferencing devices, and robots.

AGC

Automatic Gain Control

Maintain consistent voice levels across distances

Automatically adjusts input gain to keep voice output stable, improving downstream ASR performance when users speak at different distances and volumes.

NS

Noise Suppression

Enhance voice clarity in noisy environments

Suppresses unwanted background noise such as fan noise, keyboard typing, and ambient chatter, improving signal-to-noise ratio for smarter voice applications.

Feature 2: Capture Clear Voice From Any Direction Up to 5m Away

With far-field voice capture up to 5 meters and a circular 4-microphone array design supporting precise Direction of Arrival (DoA) detection, the reSpeaker XVF3800 delivers reliable voice capture and accurate sound source localization for interactive and voice-driven applications.

Watch the pickup range test from 12:20

Feature 3: Developer-Friendly

With **plug-and-play setup**, a **compact form factor** for embedded scenarios, and **flexible audio connectivity**, reSpeaker XVF3800 enables developers to move from prototype to deployment with minimal complexity.

1. Plug-and-Play Simplicity

Standard USB interface enables easy connection with any USB-enabled device - from SBCs like Raspberry Pi and NVIDIA Jetson to PCs running Windows, Linux, or macOS. No drivers or complex setup required.

2. I2S Interface for MCU Integration

Direct I2S support allows seamless integration with MCU platforms like XIAO Series and Arduino, enabling embedded voice applications with minimal hardware overhead.

3. Compact Design for Embedded Applications

Bottom-firing microphones and a flat PCB for easy embedding into space-constrained devices without obstruction.

- The microphone port is located on the side with the **Seeed Studio logo** printed on it.
- Please make sure the **Microphone Port (Mic Inlet / Sound Hole)** on the back side of the device is facing toward the sound source.

4. 3.5mm Audio Interface

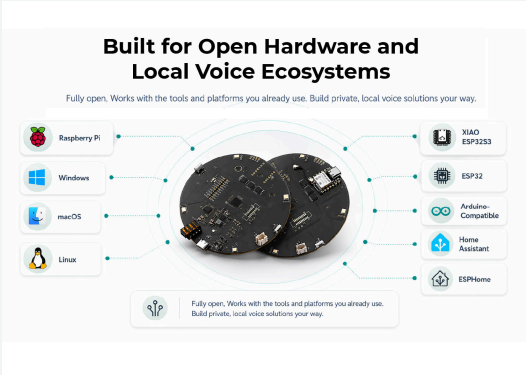
Provides flexible connectivity for external speakers or audio output devices, simplifying hardware design and ensuring compatibility across a wide range of embedded systems.

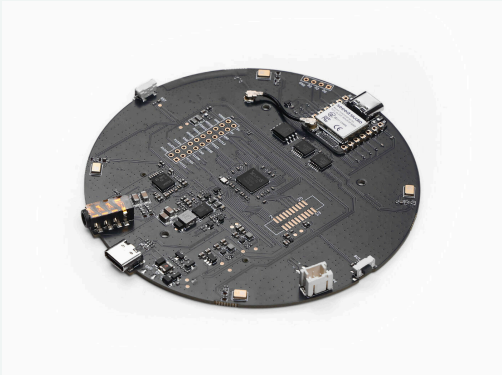
Feature 4: Seamless Integration for Deployment

reSpeaker XVF3800 is a go-to choice for fast building solutions that enable seamless hardware and software integration across diverse application scenarios.

With **XIAO ecosystem compatibility**, **robotics adaptability**, and streamlined **Voice Agent** enablement, it reduces integration complexity and shortens time-to-market.

Product Gallery





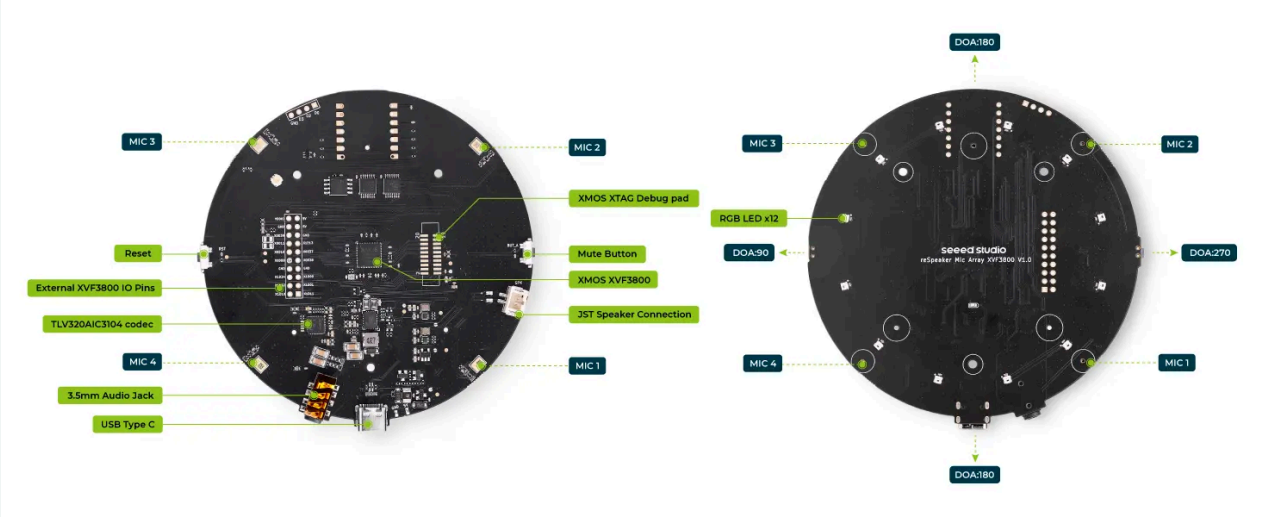
Specification

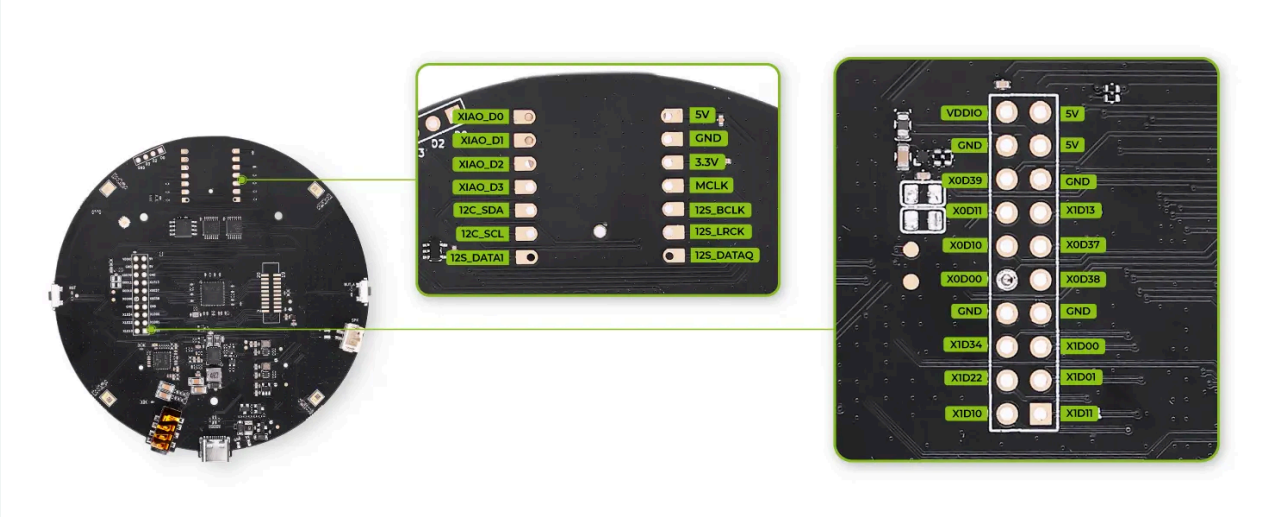
Core Chip	XMOS XVF3800
Digital Microphones	High-performance digital microphones * 4
Sensitivity	-26 dBFS
Acoustic Overload Point	120 dBL
SNR	64 dBA
Power Supply	USB 5V, external 5V
Dimensions	102mm x 102mm x 10mm
Audio Output	Speaker Connector / 3.5mm Headphone jack
Maximum Sampling Rate	16Khz
Speaker	Supports 5W amplifier speakers.

	reSpeaker Flex	reSpeaker XVF3800	reSpeaker Lite	reSpeaker Pi
Product	reSpeaker Flex XVF3800 Circular-4 reSpeaker Flex XVF3800 Linear-4 reSpeaker Flex XVF3800 Circular-4 with XIAO ESP32S3 reSpeaker Flex XVF3800 Linear-4 with XIAO ESP32S3	reSpeaker XMOS XVF3800 reSpeaker XMOS XVF3800 with XIAO ESP32S3 reSpeaker XMOS XVF3800 with Case reSpeaker XMOS XVF3800 with XIAO ESP32S3 (Case Version)	reSpeaker Lite (bare board) reSpeaker Lite with XIAO ESP32S3	reSpeaker 2-M
Mic Array Type	Circular/Linear	Circular	Linear	Linear
Mic Spacing	Circular: 44mm Linear: 33mm	66mm	70mm	/
No. of Mics	4 PDM MEMS Microphones	4 PDM MEMS Microphones	2 PDM MEMS Microphones	2 Analog Mic
Chip	XMOS XVF3800	XMOS XVF3800	XMOS XU316	TLV320AIC310
Pickup Distance	Up to 5m	Up to 5m	Up to 3m	Up to 3m
Voice Capture	Circular: 360° Linear: 180°	360°	180°	/
AI Algorithms	AEC Noise Suppression VNR AGC DoA De-Reverberation Multi-beamforming	AEC Noise Suppression VNR AGC DoA De-Reverberation Multi-beamforming	IC EC AEC Noise Suppression VNR AGC VAD	VAD DoA
Speaker	10w	5w	5w	/
Connectivity	USB, I2S	USB, I2S	USB, I2S	I2S
LED	1 Power LED (green, solid on)	12 Programmable RGB LED	1 Programmable RGB LED	3 Programma
Compatibility	XIAO ESP32S3 Raspberry Pi Jetson PC any platform supports I2S and USB Audio	XIAO ESP32S3 Raspberry Pi Jetson PC any platform supports I2S and USB Audio	Raspberry Pi Jetson PC any platform supports I2S and USB Audio	Raspberry Pi Raspberry Pi Raspberry Pi

Applications	Robotics Integration Digital Signage Educational Terminal Embedded Application	Smart Home Voice Control Robotics Integration Physical AI Voice Agent Smart Voice Assistants Smart Conference	Wireless Voice Asistants Home Assistant Integration DIY projects Prototyping Education	Raspberry Pi

Hardware Overview





Applications

- **Smart Home Voice Control Using reSpeaker XVF3800 Microphone Array:** The reSpeaker XVF3800 4-mic array with XIAO ESP32S3 can be seamlessly integrated into Home Assistant voice systems, serving as dedicated Home Assistant voice hardware for localized control and smart home automation.
- **Robotics Integration with reSpeaker XVF3800 for Embedded Applications:** The compact design supports smooth integration into robotic platforms, with support for ROS2 to streamline system-level communication and development. 4-mic array enables 360° voice localization, voice command recognition, and noise suppression for interactive robotics, smart toys, and voice-controlled machines. Ideal choice for reliable voice interaction and human-machine communication across service, education, and industrial robotics applications.
- **Build Physical AI Voice Agent with reSpeaker XVF3800:** Through SDK and platform compatibility, reSpeaker XVF3800 supports rapid integration with voice AI frameworks and cloud-based services, allowing devices to be quickly transformed into scalable voice agent solutions.
- **Running Agora TEN Framework on reSpeaker XVF3800:** Use reSpeaker XVF3800 with XIAO ESP32S3 (https://www.seeedstudio.com/ReSpeaker-XVF3800-4-Mic-Array-With-XIAO-ESP32S3-p-6489.html) for audio capture and playback, and use Agora RTC to complete the real-time audio connection. The project provides a standardized configuration method (.env / property.json), supports one-click Docker deployment, dynamic token authentication, and pluggable providers (ASR/LLM/TTS can be replaced as needed). https://wiki.seeedstudio.com/respeaker_xvf3800_agora_ten_framework_client/
- **Running Agora Conversational AI on reSpeaker XVF3800:** Use reSpeaker XVF3800 with XIAO ESP32S3 (https://www.seeedstudio.com/ReSpeaker-XVF3800-4-Mic-Array-With-XIAO-ESP32S3-p-6489.html) as an edge voice AI device to establish a stable, low-latency, bidirectional audio link via Agora RTC, and directly call Agora Conversational AI Agent API v2 on the device to complete the conversational loop of ASR → LLM → TTS: the microphone array captures audio and sends it uplink; the cloud AI generates spoken replies and sends them downlink; the device plays them back in real time—delivering a “phone-call-like” voice conversation experience. https://wiki.seeedstudio.com/respeaker_xvf3800_agora_convo_client/
- **On-Edge AI Voice Agent Using reSpeaker XVF3800 and Jetson AGX Orin:** After the microphone array detects a custom wake word, reSpeaker captures a 5-second voice query and uses a local STT engine. A local Llama 3 model then processes the query, enhanced by a RAG architecture for accurate knowledge retrieval and reasoning. The final answer is generated through a local TTS engine. The solution supports deployment across multiple local environments, including NVIDIA Jetson, Raspberry Pi, x86 servers, and Linux / Windows systems. https://wiki.seeedstudio.com/respeaker_voice_assistant/
- **Build Xiaozhi AI Voice Assistant with reSpeaker XVF3800:** Using reSpeaker XVF3800 to build a compact, cloud-connected Xiaozhi voice assistant powered by large language models. With professional far-field audio capture and robust noise suppression, it transforms lightweight edge hardware into a scalable Voice Assistant. https://wiki.seeedstudio.com/respeaker_xvf_3800_xiaozhi/
- **Bulid You Own OpeClaw Voice AI Agent with reSpeaker XVF3800:** With reSpeaker's powerful audio capture, combined with OpenClaw's flexible AI agent framework, you can easily create a voice-controlled smart assistant that can automatically understand and respond to your commands. (e.g. locate Lark groups and send interactive meeting invitation cards/Voice-based summarization and automated email delivery) https://wiki.seeedstudio.com/respeaker_xvf_3800_openclaw/
- **Build Your AI Assistant Voice Interface with MimiClaw & reSpeaker XVF3800:** MimicLaw is a lightweight implementation inspired by OpenClaw. It explores how similar agent logic can run in extremely resource-constrained environments. By using reSpeaker XVF3800 as the voice interface, we can turn MimicLaw into something more tangible: a physical AI companion that lives on your desk and interacts naturally through voice. https://github.com/Wkstr/mimiclaw
- **Build Smart Voice Assistants Using reSpeaker XVF3800:** Seamlessly integrates with Amazon Alexa, Google Assistant, Home Assistant, and other mainstream voice AI platforms for far-field voice control, smart home automation, and interactive voice applications.

- **Smart Conference Solutions Using reSpeaker XVF3800:** Compatible with Microsoft Teams, Zoom, and other popular conferencing software via USB. 4-mic array supports beamforming and DoA detection to deliver clear multi-person audio pickup and real-time status feedback.
- **Smart Meeting Solutions Using reSpeaker and reRouter:** reSpeaker 4-mic array transforms meetings into structured, actionable insights. Designed for conference rooms, reSpeaker can clearly capture voices from a distance(up to 5 meters), handle multiple speakers, and continuously record discussions. By running local recording, STT, and AI-powered summarization, the entire process happens on-device. This ensures privacy, reduces deployment complexity, and makes it ideal for long-term use in offices, meeting rooms, and interview spaces.

Part List

reSpeaker XMOS XVF3800 with XIAO ESP32S3 (Case Version)	x1

Compliance & Logistics

HSCODE	8519899000
USHSCODE	8519893000
UPC	
EUHSCODE	8517180000
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/ReSpeaker-XVF3800-With-Case-XIAO-ESP32S3-p-6628.html
- XMOS XVF3800 v3.2.1
- reSpeaker XVF3800 Flyer
- reSpeaker XVF3800 Flyer(Chinese)
- reSpeaker Series Flyer
- reSpeaker XVF3800 3D File - Board
- reSpeaker XVF3800 3D-Enclosure-Up File
- reSpeaker XVF3800 3D-Enclosure-Down File

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