



NEW PRODUCT HIGHLIGHT

ECM & MEMS Microphones

Jul 16th, 2025

Table Of Contents

Introduction & Key Applications	3
Key Features	4
Electrical Connections	6
When to Choose ECMs & MEMS	6
Conclusion	7

Introduction

PUI Audio is proud to introduce a new line of high-performance ECM (Electret Condenser Microphone) and MEMS (Micro-Electro-Mechanical Systems) microphones, manufactured outside China. This expanded offering gives customers greater sourcing flexibility while maintaining the exceptional quality, reliability, and acoustic performance PUI Audio is known for.

ECM (Electret Condenser Microphone) microphone: Our ECM models feature a diaphragm positioned in front of a backplate embedded with electret material, which holds a permanent electric charge. When sound waves strike the diaphragm, it vibrates, leading to variations in the capacitance between the diaphragm and the backplate. These capacitance changes are then converted into an electrical signal, which is amplified by an internal Field Effect Transistor (FET) and transmitted to the output.

MEMS microphone: The MEMS microphone models feature a specialized preamplification ASIC that delivers high sensitivity and excellent signal-to-noise ratio from a compact capacitive audio sensor. Designed for surface mounting and high-temperature reflow assembly, these microphones combine ultra-low current consumption with low distortion and a high acoustic overload point—providing exceptional dynamic range and reliability. With these advancements, PUI Audio continues to offer competitive, high-performance solutions for today's audio applications.



Key Applications

- **Medical Devices:** Wearables and fitness trackers for voice control and audio recording, Respiratory monitoring – sensing breathing sounds or coughs
- **Industrial Applications.** In machine monitoring and production lines to detect malfunctions or predictive maintenance.
In-cabin operator safety systems to monitor audio cues in harsh environments
- **Security Monitoring Devices.** Ideal for glass-break detection and acoustic-based fire alarm systems requiring precise, high-SNR audio input.
- **Microphone Arrays.** Supports beamforming, noise cancellation, and directional voice capture in multi-mic configurations
- **Consumer Electronics.** In earphones, smart IoT devices, and voice-controlled assistants for clear, low-noise audio capture.

Key Features

New ECM Microphones

- 4mm to 6mm diameter with as low profile as 1.5mm
- Unidirectional and Omnidirectional mics
- High Signal-to-Noise up to 75dB
- Wide frequency response
- High Sensitivity up to -22 ± 3 dBV
- Low current consumption across a wide supply voltage from 1.0 to 10V

PUI Part Number	Dimensions (mm)	Sensitivity (dBV)	SNR (dB) Typ.	AOP (SPL)	Current (μ A) Typical	Supply Voltage (V)
POM-2722L	6.0 X 6.0 X 2.7	-22 ± 3	60	100	500	$1.0 \leq V_S \leq 10$
AUM-4538L	9.7 X 9.7 X 4.5	-38 ± 3	60	110	450	$1.0 \leq V_S \leq 10$
TOM-1542L-2	4.0 X 4.0 X 1.5	-42 ± 3	60	110	450	$1.0 \leq V_S \leq 10$
POM-2032L	6.0 X 6.0 X 2.0	-32 ± 3	75	110	450	$1.0 \leq V_S \leq 10$

New MEMS Microphones

- High signal-to-noise ratio up to 68 dB
- High sensitivity up to -26 ± 1 dBV
- Low current consumption, down to 140 μ A
- 2.65 to 2.95 mm diameter with a surface-mount package under 1 mm in height

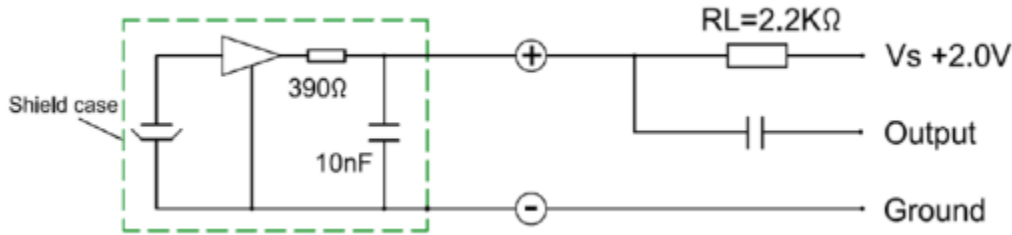


Output Signal Type	PUI Part Number	Dimensions (mm)	Sensitivity (dBV)	SNR (dB) Typ.	AOP (SPL)	Current (μ A) Typical	Supply Voltage (V)
Digital	DMM-4026-2-T	2.75 X 1.85 X 0.9	-26 ± 1	58	122	780	$1.65 \leq V_S \leq 3.6$
Analog	AMM-3742-3-T	2.95 X 3.76 X 1.1	-42 ± 1	57.5	133	140	$1.5 \leq V_S \leq 3.6$
Digital	DMM-2726-B	2.75 X 1.85 X 0.9	-26 ± 1	64	121	780	$1.6 \leq V_S \leq 3.6$
Analog	AMM-2738-4-B	2.75 X 1.85 X 0.9	-38 ± 1	64	128	160	$1.65 \leq V_S \leq 3.6$
Analog	AMM-3538-4-B	2.65 X 3.50 X 1.0	-38 ± 1	65	128	160	$1.5 \leq V_S \leq 3.6$
Digital	DMM-3526-5-B	2.65 X 3.50 X 1.0	-26 ± 1	65	122	780	$1.62 \leq V_S \leq 3.6$
Digital	DMM-3537-2-B	2.65 X 3.50 X 1.0	-37 ± 1	68	135	310	$1.65 \leq V_S \leq 1.98$

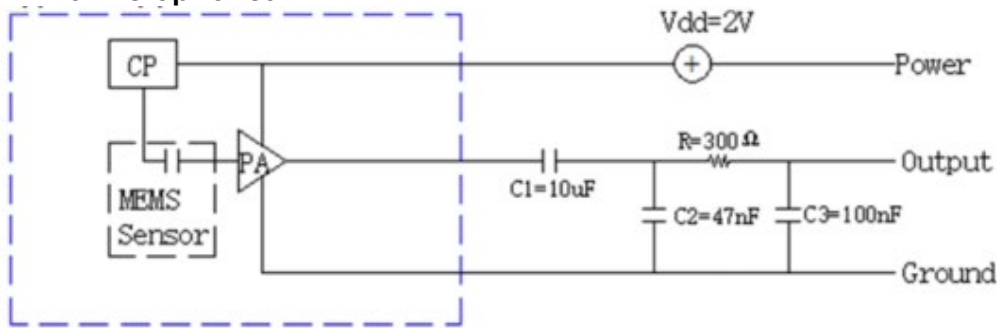
In conclusion, our new MEMS microphones have high-end performance with Signal to Noise ratio (SNR) of ≥ 57 dB, Acoustic Overload Point (AOP) of ≥ 121 dB SPL, and ultra-low maximum supply current to enable better sound quality and efficiency in the end application.

Typical Electrical Connections

ECM Microphones



MEMS Microphones



Typical scenarios when to Choose ECMs

Cost Sensitivity (Microphone Component)	More cost-effective for the microphone itself
Legacy Product Integration	Easier to integrate into legacy designs or existing ECM-based products
Environmental Resistance (e.g., High IP Ratings)	Larger size allows better sealing for high IP ratings
Voltage Range Flexibility	Tolerates wider operating voltage ranges
Mounting Flexibility	Offers multiple mounting types: wires, pins, SMT, solder pads, spring contacts
Noise Cancellation / Directionality Needs	Stronger for unidirectional pickup and noise canceling applications

Typical scenarios when to Choose MEMS

Reflow Soldering Compatibility	Can withstand reflow soldering, simplifying modern automated assembly
Space-Constrained Designs	Smaller form factor with high performance density
Temperature Stability	Less sensitivity variation across wide temperature ranges
Vibration-Prone Environments	Lower vibration sensitivity (12 dB improvement vs ECMs)
Consistency Across Units (e.g., Arrays)	More uniform frequency response across units
Low Power / Voltage Applications	Lower power and voltage requirements
Electrically Noisy Environments	Lower analog output impedance. Available digital output reduces EMI and simplify MCU interfacing

Next Steps

Let PUI Audio power your next design with precision and performance! Our engineering team is eager to develop new solutions and continue pushing the envelope.

Curious to learn more? Ready to kick off a brainstorming session about your audio needs in the medical, industrial, security, IoT, or consumer markets? Reach out! Meet with an engineer or chat with us - we're here to help.

We've previously published white papers on ECM and MEMS microphones. You can access them by visiting our website's Resource Library and applying the "Microphones" filter.

- [Inside a Microphone: Working Principle and Types](#)
- [Choosing the Right Microphone](#)
- [The Power of Direction: Understanding Unidirectional Microphones](#)