

Vesper Piezoelectric Technology Enables Always-On Ultra-Low Power Microphones Array

The consumer and automotive space has seen an exponential increase in MEMS microphone adoption over the last few years.

Mobile phones, TWS earbuds, the smart home, virtual reality devices, electric vehicles, and more are leveraging powerful AI algorithms to enable new features and capabilities. Edge-processing will play an ever-crucial role as the entire audio signal chain architecture is shifting towards the **adoption of always-on, low power microphone arrays.**

Has MEMS microphone development adapted to this recent shift in audio signal chain architecture?

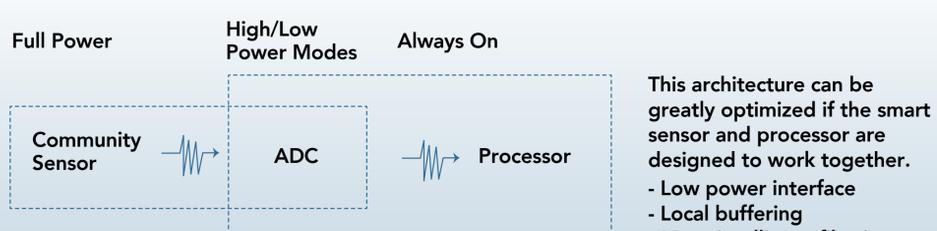
Capacitive MEMS microphone manufacturers have been focused on improving traditional KPIs:

- **Increasing signal-to-noise (SNR) ratio**
- **Keeping the frequency response (FR) as flat as possible**
- **Reducing power consumption at the component level**

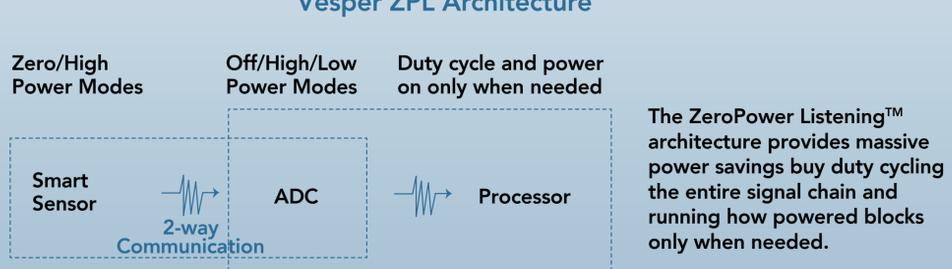
The resulting microphones use continuously running, low power DSPs for "always on" features and rely on a local buffer to meet system performance requirements. Unfortunately, this approach increases system power consumption and overall cost.

For these reasons, audio engineers designing battery-operated microphone arrays with always-on features find it difficult to use capacitive microphones without compromising system power consumption or user experience.

Traditional Architecture



Vesper ZPL Architecture



Vesper Technologies' MEMS microphones bring intelligence to the extreme edge of the network.

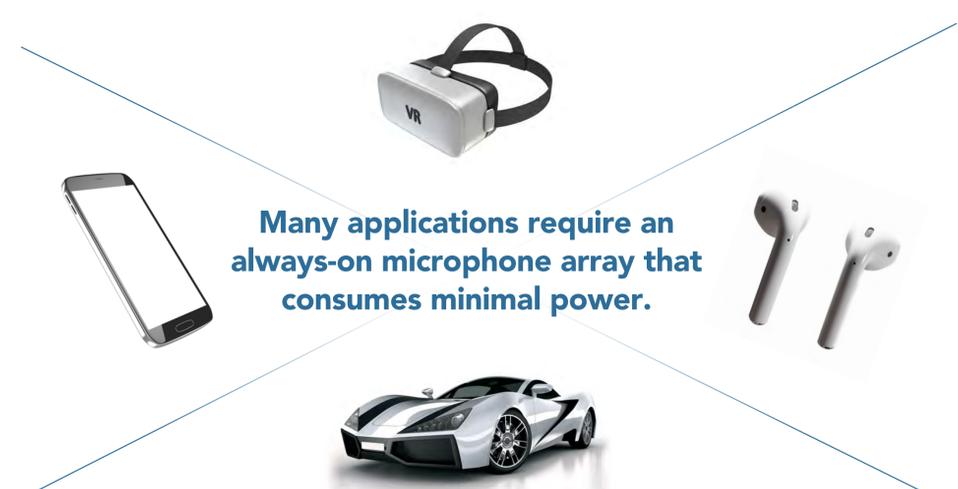
Its ZeroPower Listening™ microphones feature always-on, low power arrays for enabling a new generation of applications.

Vesper currently offers two devices with ZPL:

VM3011
(Adaptive ZeroPower Listening™ Digital Mic)

VM1010
(ZeroPower Listening™ Analog Mic)

ZPL enables "always listening" systems to capture audio signatures without compromising total system power and cost. Through actual development efforts with customers and partners, Vesper has conclusively demonstrated ZPL's ability to turn off the entire audio signal chain 80% of the time—in both quiet and noisy environments—thereby reducing system power consumption by 5X.



Vesper offers an optimal solution for always-on microphones arrays.

VM1010 - First ZPL analog single-ended microphone. ZPL is triggered when sound levels exceed an absolute threshold (configurable with an external resistor).

VM3011 - First adaptive ZPL digital microphone. The adaptive loop is capable of tracking the RMS background noise levels and reducing the number of wake-on-sound events. The adaptive ZPL is configurable via I2C interface.

VM3000 - First Vesper digital Microphone with an IP68 rating, ideal for extreme and rugged environments

VM2020 - First high AOP analog differential microphone capable of sustaining a high AOP (152dB SPL) while maintaining a low THD (< 10%), ideal for barge-in and feedback loops.

Is Vesper working on high performance acoustic microphones?

Yes. Vesper is committed to improving the acoustic performance of microphones; for example, through increasing SNR by 70dB+ in a small form factor with ZPL for ultra-low power consumption. Our latest funding round will accelerate new developments in process and design technology, enabling us to bring the most advanced, high performance acoustic capacitive microphones to market.

Learn More
vespermems.com

