



# Product Brief AEV13-MZ

## Aaware Embedded Voice

### Platform Overview

Aaware's Embedded Voice platform provides a complete single-chip, voice user interface (VUI) solution focused on product applications where privacy, security and reliability are important and where strong interfering noise sources are present.

#### Getting the Noise Out

The number one job for a great VUI is accuracy, which allows it to feel invisible and ubiquitous. This all starts with clearing up the sound field so the follow-on wake word, automatic speech recognition (ASR) and natural language understanding (NLU) technologies can recognize & understand the voice input. The Aaware voice capture algorithms include, proprietary spatial/spectral/temporal source separation, masking, noise suppression, acoustic echo cancellation (AEC) and source localization delivering clear and low distortion voice sources that can be accurately detected.

#### Acceleration at the Edge

The Aaware DSP algorithms and AI models are accelerated using the FPGA fabric, optimizing performance, offloading the CPU, and reducing cost and power. Using the FPGA fabric, Aaware packs more audio processing in this dual core than is possible in traditional quad cores running at twice the clock speed allowing a full VUI to run on this Zynq 7010.

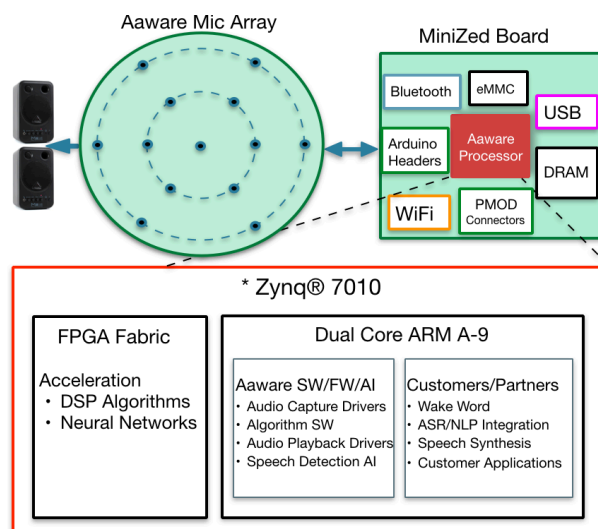
### Flexible Algorithm

Aaware voice capture algorithms can be customized for non-uniform arrays to match your product's physical constraints and for fixed spatial zones where interfering noises are known and stationary.

### Key Features & Benefits

- Complete embedded voice UI for quick and easy product prototyping
- Private, secure, instantaneous and reliable
- Integrated 3rd party wake word/ASR/NLU
- Flexible microphone array - up to 13
- Detection of voice arrival direction
- Multi-channel AEC for barge-in capability
- Ubuntu OS, ALSA, I2S, and LED drivers
- WiFi/BT, Ethernet and USB interfaces
- Secure Boot with eFUSE - prevents unauthorized application use

### Platform Block Diagram



## Pulling it All Together

Critical to making a VUI integrate more easily into your product is pulling the entire voice flow together into a flexible and open prototyping platform. Aaware has partnered with key wake word and ASR/NLU providers and integrated their technology onto the AEV Platform. This combination gives product teams three complete embedded voice flow choices (illustrated below) integrated with our flexible multi-mic array and Xilinx Zynq All Programmable SoC, providing a powerful embedded VUI prototyping platform.

## Private and Secure Voice

By compressing a full VUI on a single-chip solution, Aaware and it's partners enable private and secure voice for your product.

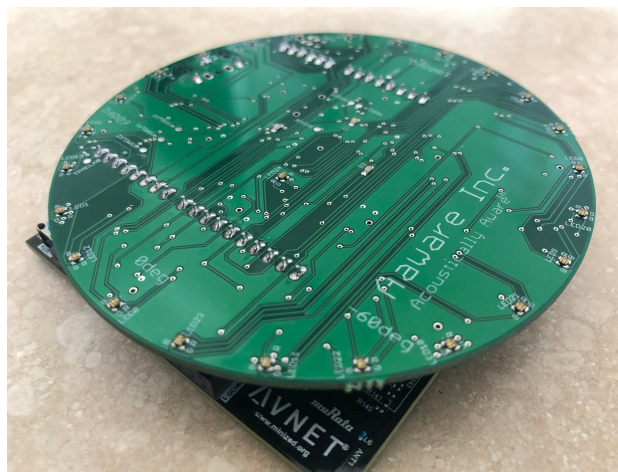
## Easy to Use and Flexible Platform

In addition to three VUI choices, product teams can experiment with different mic array configurations (up to 13 mics) and integrate embedded software using the popular Ubuntu OS. The AEV13MZ platform is complete and ready to use out of the box, with Ubuntu 18.04 and an ALSA based audio interface, making it immediately prototype ready. Contact Aaware for a free VUI design consultation and we can help you choose a mic array configuration and embedded voice flow that fits best for your product.

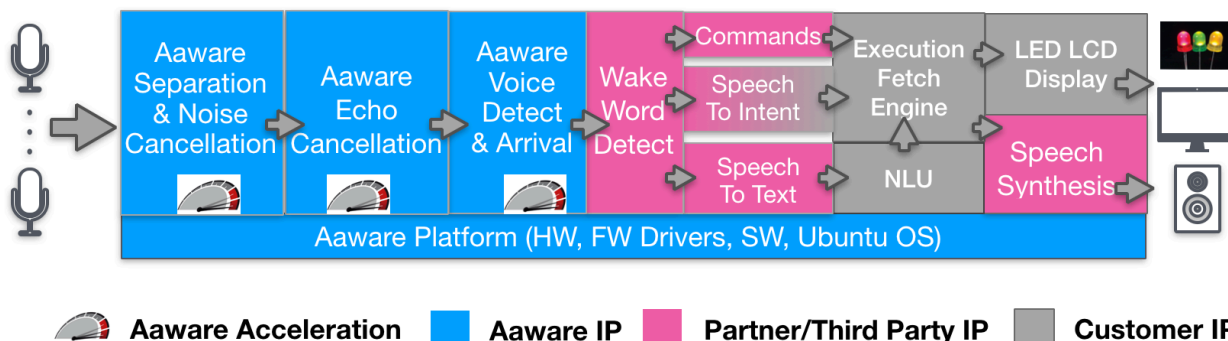
## AEV13MZ Platform Specifications

**MiniZed Processor Board Specs	
Processor	Dual-Core 667MHz ARM Cortex-A9
FPGA Fabric	430k programmable gates
Memory	512MB of LP DDR3L RAM
Wireless	Bluetooth 4.1 BLE - WiFi 2.4GHz 802.11b/g/n
Flash	128MB QSPI Flash + 8GB eMMC
Power & Console	microUSB 2.0

*** Infineon Microphone Specs		
Parameter	Conditions	Typical
Supply Current	Clock=2.4 MHz, V <sub>DD</sub> =1.8 V, T=25 °C	800µA
Sensitivity	1 kHz, 94 dB SPL	-36 dBFS
Signal to Noise	A-weighted @ 2.4 MHz	68 dB
Harmonic Distortion	94 dB SPL (1 kHz)	0.5%
Acoustic Overload	THD = 10%	130 dB SPL



## Three Voice Flows on Platform



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