

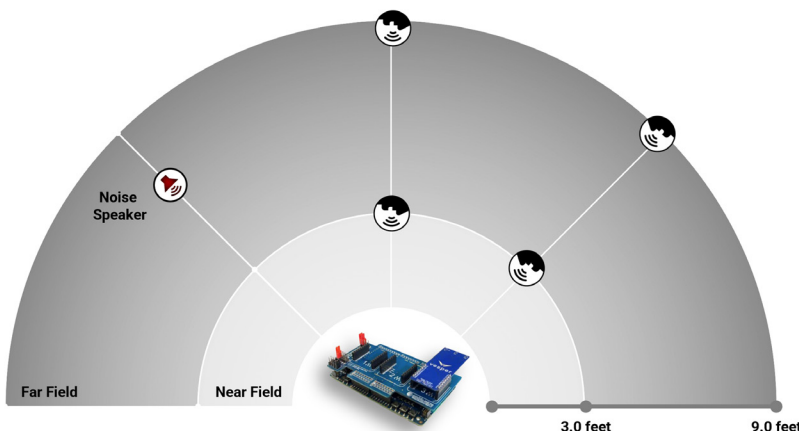
# Apollo3 Blue Plus Voice-on-SPOT Kit

## Product Brief

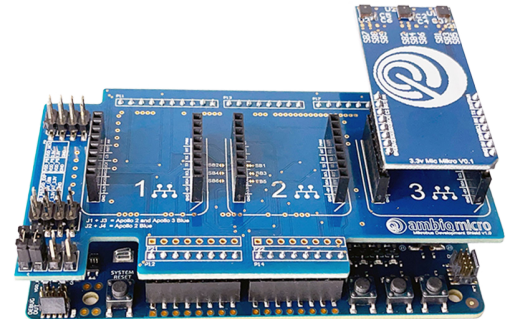
The Apollo3 Blue Plus Voice-on-SPOT® (VoS®) Kit facilitates demos, evaluation, and the development of ultra-low power audio and voice capabilities on the Ambiq® system on chip (SoC). The Kit provides always-on voice capability with options for one or two microphones, signal processing, wake word/command detection, codec, and Bluetooth® Low Energy communication. The Kit delivers the complete ultra-low power solution at the MCU and system levels. Depending on application requirements and customer aspirations, the Kit can enable battery life up to a year or more on standard alkaline or lithium batteries.

- Industry-leading ultra-low power processing with hardware Pulse Density Modulation (PDM) to Pulse Code Modulation (PCM) conversion.
- Integrated Bluetooth Low Energy radio for smart home and IoT applications.

The kit can be configured with or without pre-roll<sup>1</sup>. The lowest power scenario is without pre-roll which is described here. The Apollo3 Blue Plus wakes in microseconds and runs Ambiq or third-party software using less than 1MHz that identifies voice spectral characteristics. If it detects voice, then it turns on the wake word engine (Wake-on-Voice). Ambiq software dynamically manages and tunes this process. When a wake word is detected, a codec appropriate for the application compresses the utterance and can transmit over Bluetooth Low Energy. The Kit has been tested with close talk, near field, and remote control far field under standard testing conditions for False Rejection Rate (FRR), False Acceptance Rate (FAR), and Response Accuracy Rate (RAR). Independent and thorough testing has been conducted of the VoS Kit at various sites, including partners' and Ambiq's audio labs.



Apollo3 Blue Plus Voice-on-SPOT SDK Near Field and Far Field Non-Speaker



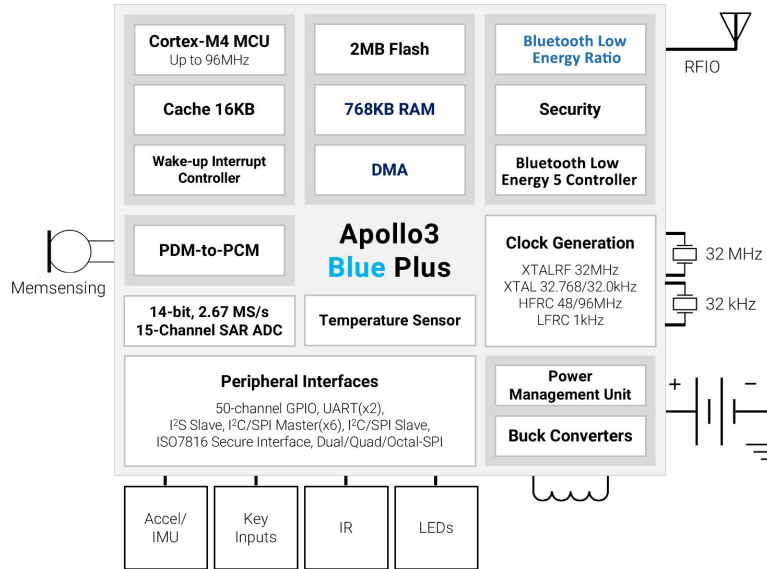
Apollo3 Blue Plus Voice-on-SPOT Kit

### Feature Highlights:

- Ambiq's patented SPOT® technology provides up to 10x lower active power consumption than competing voice solutions.
- Inclusion or exclusion of audio and other functional features to create baseline and diagnostic builds.
- One or two PDM-driven digital microphones connected to Apollo SoC's stereo PDM interface.
- Capture of an audio buffer output over Bluetooth Low Energy (AMA protocol) to Amazon Alexa app for using Alexa Voice Service (AVS).
- Capture of an audio buffer output over Bluetooth Low Energy (ATV Voice Service protocol) to Android TV or set-top box for using Google Assistant.
- Transfer of an audio buffer between Apollo family EVBs and over SEGGAR RTT interface to a PC for the generation of a WAV file.

<sup>1</sup> Pre-roll stands for audio stream preceding wake word

## Features and Specifications



Apollo3 Blue Plus Voice-on-SPOT SDK Diagram

### Ultra-Low Supply Current

- Apollo3 Blue Plus
  - 6  $\mu$ A/MHz MCU
  - 1  $\mu$ A deep sleep power

### High-Performance Arm® Cortex®-M4F Processor

- Up to 48 MHz nominal clock frequency with 96 MHz turboSPOT® Mode

### Ultra-low Power Memory

- 2MB of flash memory
- 768KB of low power RAM
- 16KB 2-way Associative/Direct-Mapped Cache

### Integrated Bluetooth Low Energy

- RF Sensitivity: -93dBm
- TX Power: +3dBm max

### Wide Operating Range

- 1.755 - 3.63 V, -45°C to 85°C

### Hardware

- Apollo3 Blue Plus EVB
- Apollo3 Blue Plus Audio Shield Click Board
- DMIC (Digital Microphone) Click Board
  - Memsensing MSM261D4030H1AP (x3)

### Software

- Ambiq
  - VoS SDK
  - Wake-on-Voice
  - Filters
  - Codec:
    - Opus
    - mSBC
    - ADPCM
- Third Party
  - Signal Processing:
    - DSP Concepts
  - Wakeword/Command Detection:
    - Sensory

### Applications

- Smart watches/bands
- Trackers
- Remote Controls
- Remote Mics
- Gaming Controllers
- Smart Sensors

### Ordering Information

- AMA3BPVOS

Product images shown are for illustration purposes only and may not be an exact representation of the products.



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