EveryWord Far-Field AVS Reference Design Kit with FlexArray Technology

Amazon AVS Qualified Far-Field Solution

Features

- Increases accuracy and reliability of "Alexa" wake-word triggering and command recognition, at far-field distances and in noisy environments

- Supports far-field operation with 2, 3, or 4 microphones

- FlexArray™ Technology supports arbitrary mic array geometries, including circular, square, triangular, linear or 3-D

- 6 mics built-in, ready to be configured for testing circular, square, triangular, and line arrays in 4-mic, 3-mic or 2-mic designs

- AEC is scalable to mono, stereo, 3-channel, and 5-channel (surround movie or music) use cases

- Includes local high accuracy large model Amazon voice trigger or Sensory voice trigger

- Supports far-field voice call mode and in-call voice triggering

- Suitable for wall-powered devices or portable battery-operated products with low mW consumption

- AVS compliant LED indicators and mic-mute button

- Connectivity includes Wi-Fi 802.11, Bluetooth 4.1, stereo line out, USB device port, as well as a USB host port for connection to external USB soundcard

- Also includes expansion bus for connecting GPIOs, ASPs, SPI, I²C, and PDM mics

- Web-based firmware control console for simplified interactive operation, mic array selection, acoustic tuning and diagnostics

- Purchase the EveryWord Far-Field AVS Reference Design Kit here: https://arkxlabsshop.com

Flexible Reference Design for 2, 3, or 4-Mic Alexa-Enabled Smart Home Products

EveryWord™ is a complete reference design kit using the Cirrus Logic CS4LV41F high performance Amazon Alexa Voice Service (AVS) qualified far-field voice processor for the evaluation, prototyping, and rapid development of smart home products with embedded AVS. It enables rapid time to market for speakers, soundbars, TVs, hubs, home control, security, automotive, and other smart voice products.
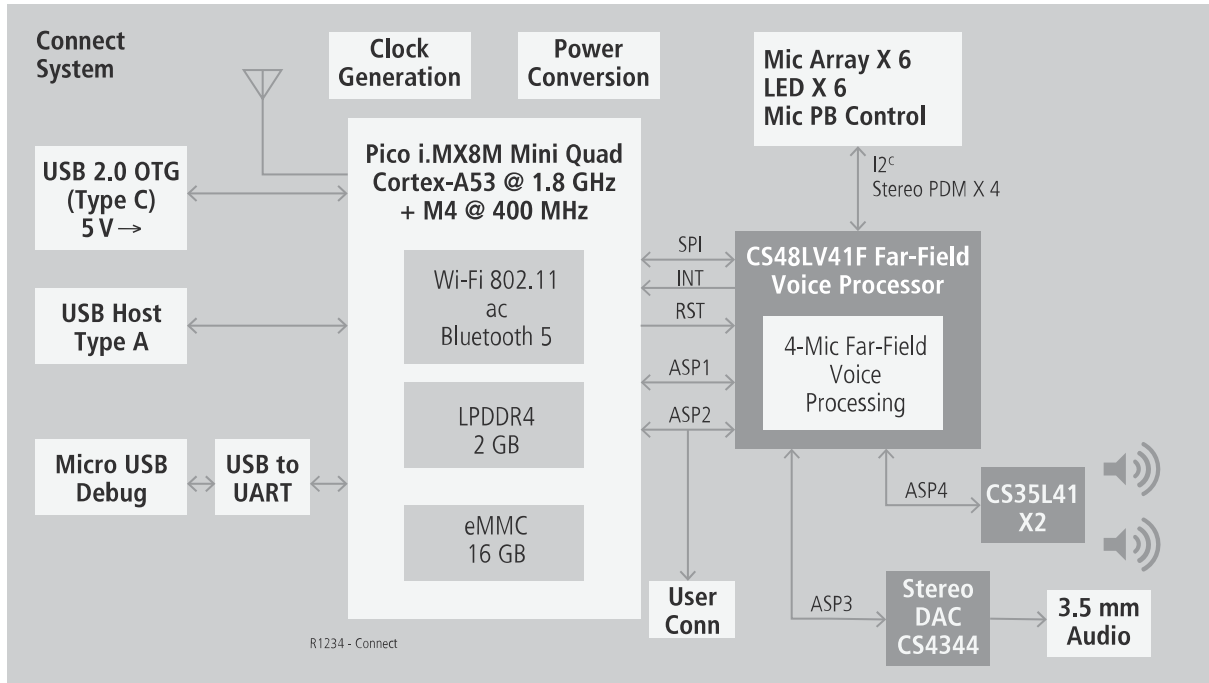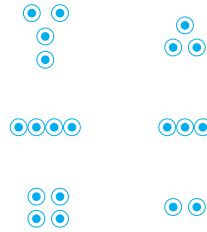
The CS48LV41F enhances AVS performance and end-user experience by increasing the accuracy of voice interactions, extending it to far-field distances (6+ meters) and allowing reliable recognition even during playback of high-fidelity, multi-channel music at high volume. This standalone solution includes all required hardware and firmware, plus a web server-based control console to configure the firmware, wake word, AVS account info, noise suppression, and barge-in (AEC) performance. Prototype development is simplified using an integrated applications processor running Linux. The control console simplifies operation of the various applications and provides a robust user friendly GUI to perform acoustic tuning and diagnostic functions.

The reference board schematic design and bill of materials can be re-used for most AVS applications with minimal customization to accelerate time to market. The sophisticated CS48LV41 far-field voice processor provides industry leading product performance for barge-in and voice capture with 2, 3, or 4-mics and includes both the Amazon and the Sensory® wake-word engines.

Far-Field Reference Board Block Diagram

Connect System

- Clock Generation
- Power Conversion
- Mic Array X 6 / LED X 6 / Mic PB Control

USB 2.0 OTG (Type C) 5 V →

Pico i.MX8M Mini Quad Cortex-A53 @ 1.8 GHz + M4 @ 400 MHz

Wi-Fi 802.11 ac Bluetooth 5

LPDDR4 2 GB

eMMC 16 GB

USB Host Type A

Micro USB Debug — USB to UART

R1234 - Connect

I2C Stereo PDM X 4

SPI / INT / RST / ASP1 / ASP2

CS48LV41F Far-Field Voice Processor

4-Mic Far-Field Voice Processing

User Conn

ASP4 → CS35L41 X2
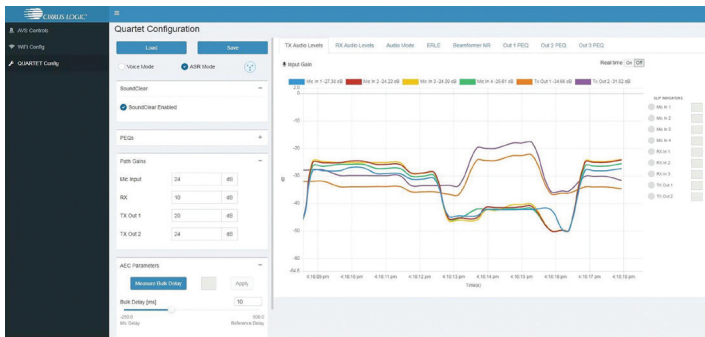
ASP3 → Stereo DAC CS4344 → 3.5 mm Audio

EveryWord Far-Field Development Kit

Supported Mic Arrays

Control Console

Simple acoustic tuning and diagnostics!

Applications

- Smart Speaker (furniture top)
- Home Control or Security (wall or ceiling mount for camera, lighting, environment monitoring)
- Soundbar (multi-channel)
- Speaker Phone (USB, Bluetooth, standalone)
- Automotive (dash cam, speakerphone, smart speaker)