

ZL38063

Microphone Array ASR-assist Audio Processor

The ZL38063 is part of Microsemi's Timberwolf audio processor family of products that improves Automatic Speech Recognition (ASR) performance at extended distances with barge-in capability and is optimized for detecting voice commands.

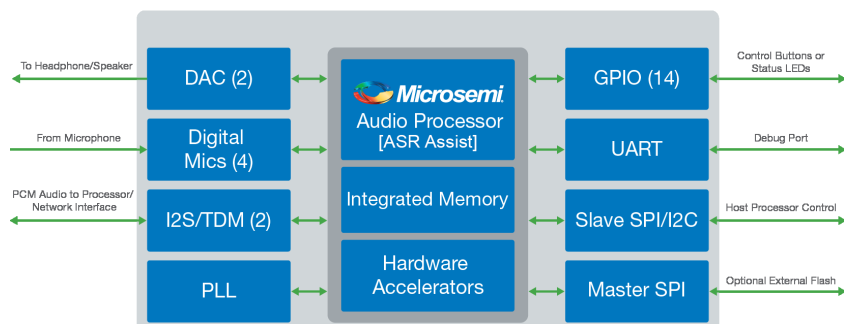
The Microsemi *AcuEdge*™ Technology ZL38063 device is specifically designed for televisions, set-top boxes, and smart speakers, but works equally well in other connected home applications. The device is capable of both voice control and 2-way full duplex audio with voice enhancements such as Acoustic Echo Cancellation (AEC), Noise Reduction (NR) to improve both the intelligibility and subjective quality of voice in harsh acoustic environments.

Microsemi offers additional tools to speed up the product development cycle. The *MiTuner*™ ZLS38508 or ZLS38508LITE GUI software packages allow a user to interactively configure the ZL38063 device. The optional ZLE38470BADA Automatic Tuning Kit provides automatic tuning and easy control for manual fine tuning adjustments.

Applications

- Integrated smart home gateways
- Connected home devices:
 - Set Top Boxes
 - Smart Speakers
 - Digital Assistants

Block Diagram



Ordering Information

- ZL38063LDF1: 64-pin QFN (9x9) package (Tape and Reel)
- ZL38063LDG1: 64-pin QFN (9x9) package (Tray)
- ZL38063UGB2: 56-ball WLCSP (3.1x3.1) package (Tape and Reel)

These packages meet RoHS 2 Directive 2011/65/EU of the European Council to minimize the environmental impact of electrical equipment.

Microsemi *AcuEdge*™ Technology ZLS38063 Firmware

The ZL38063 can run different Firmware images that target specific modes of operation. Firmware images can be swapped during normal operation to switch modes dynamically. Microsemi provides firmware images for two basic operational modes:

Two way voice communication

- Supports 2-3 microphone linear arrays for 180° audio pick up
- Supports 3 microphone off-axis or triangular arrays for 360° audio pick up
- Supports device cascading to allow up to a 6 microphones array
 - Full Narrowband and Wideband Acoustic Echo Cancellation (AEC) operation
 - Supports long tail AEC (up to 256 ms)
 - Non-Linear AEC provides higher tolerance for speaker distortions
 - Non-Linear processor
- Noise reduction
- Far-field microphone processing

ASR Assist Algorithms

- Supports 2 microphone linear arrays for 180° audio pick up
- Supports 3 microphone off-axis or triangular arrays for 360° audio pick up
- Supports device cascading to allow up to 6 microphones in a circular array for 360° audio pick up
- Support for Barge-in, or incoming trigger 'spotting' in the presence of DAC audio output
- Noise reduction
- Enhanced far-field support for distances up to 16 feet from the microphone.

ZL38063

Microphone Array ASR-assist Audio Processor

Hardware Features

- DSP with Voice Hardware Accelerators
- SPI or I2C Slave port for host processor interface
- General purpose UART port for debug
- Master SPI port for serial Flash interface
 - Boots from SPI or Flash
- Flash firmware can be updated from SPI Slave
- 14 General Purpose Input/Output (GPIO) pins (11 with the 56 pin WLCSP)
- 2 low power modes controlled by reset



The *MiTuner*™ Automatic Tuning Kit and ZLS38508 *MiTuner* GUI

Microsemi's Automatic Tuning Kit option includes:

- Audio Interface Box hardware
- Microphone and Speaker
- ZLS38508 *MiTuner* GUI software
- Allows tuning of Microsemi's *AcuEdge* Technology Audio Processor

The ZLS38508 software features:

- Auto Tuning and Subjective Tuning support
- Provides visual representations of the audio paths with drop-down menus to program parameters, allowing:
 - Control of the audio routing configuration
 - Programming of key blocks in the transmit (Tx) and receive (Rx) audio paths
 - Setting analog and digital gains
- Configuration parameters allow users to “fine tune” the overall performance

Tools

- ZLK38000 Evaluation Kit
- *MiTuner*™ ZLS38508 and ZLS38508LITE GUI
- *MiTuner*™ ZLE38470BADA Automatic Tuning Kit



Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33 | info@alcom.be | www.alcom.be
 Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands | Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl



Microsemi Corporate Headquarters
 One Enterprise, Aliso Viejo, CA 92656 USA
 Within the USA: +1 (800) 713-4113
 Outside the USA: +1 (949) 380-6100
 Fax: +1 (949) 215-4996
 Email: sales.support@microsemi.com
www.microsemi.com

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, California and has approximately 4,800 employees globally. Learn more at www.microsemi.com.

Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereunder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information itself or anything described by such information. Information provided in this document is proprietary to Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.