

DEDICATED WIDEBAND VOICE PROCESSOR FOR HANDS-FREE COMMUNICATION



The Microsemi® ZL38004 is a dedicated fully featured wideband voice processor for hands-free communication systems, including speakerphone and home automation applications. The voice processing firmware integrates the Microsemi voice processor with 16-bit dual-channel ADC/DACs, on-chip memory, and multiple interfaces. Specific Firmware loads customize the solution for various applications.

The ZLS38502 firmware pack for hands-free communication systems delivers measurable voice quality improvements. The echo tail cancellation capability is programmable up to 128 ms¹ in wideband allowing for echo cancellation in mid to large size conference rooms.

Unlike most competing devices, the ZL38004 voice processor platform provides high performance full-duplex operation.

Integrated ZL38004 Platform for Hands-Free Communication Systems

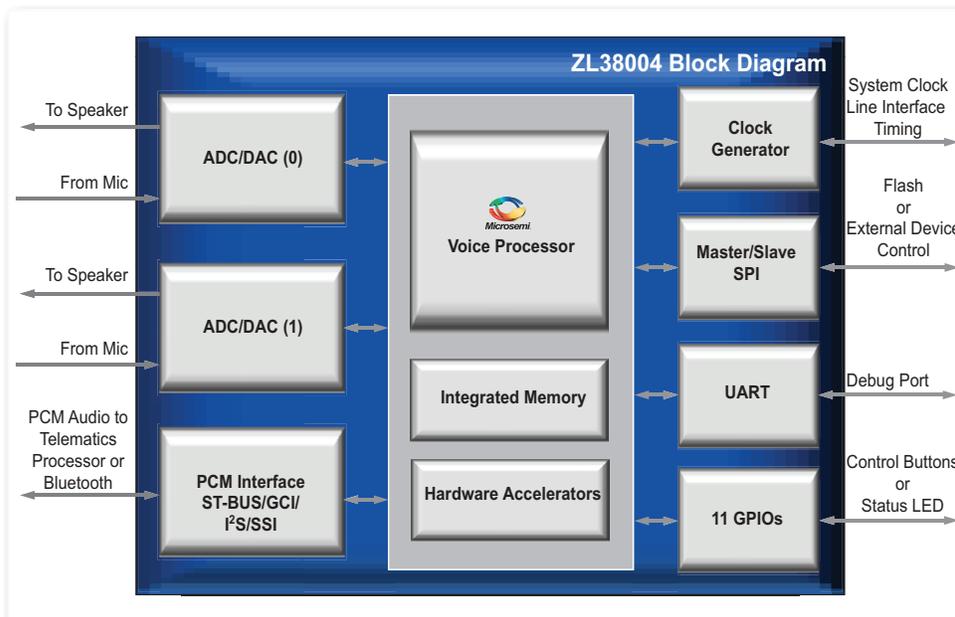
- 100 MHz (200 MIPS) Microsemi voice processor
- Dual Δ/Σ ADCs with input buffer gain selection programmable to 8/16 kHz sampling
- Dual Δ/Σ DACs with output sampling of 8/16 kHz
- Stereo bypass mode provides 44.1/48 kHz sampling for DAC
- PCM port supports TDM (ST BUS, GCI, or McBSP framing), SSI modes
- Dual function inter-IC sound (I2S) or secondary TDM port
- Separate slave (microcontroller) and master (flash) SPI ports
- 11 general purpose input/output (GPIO) pins
- Full-duplex operation

Integrated ZLS38502 Firmware Features

- Supports AEC and LEC
- Programmable echo tail up to 128 ms¹ in wideband
- Controllerless mode
- Programmable sidetone
- Cancels echo with a signal to echo ratio of up to 15 dB
- Advanced noise reduction (up to 30 dB)

Optional ZLS38503 Answering Machine Firmware

- Voice recording and playback
- DTMF receiver
- Tone generator
- Call progress tone detection
- Easy file management



Hands-Free Applications

- Conference phones and telepresence units
- Speakerphones
- Intercom and security systems
- Home automation

Customer Support

The ZL38004 voice processor platform is supported by evaluation boards, an auto tuner board, reference designs, a full firmware package and the Microsemi network of in-house field application and design engineers.

1. AEC can support tail lengths with RT60 up to 128 ms in wideband

ZL38004

Hands-Free Communication Systems

Hands-free technology is also a key element in speakerphones and telepresence units, as well as voice-enabled security, door entry, elevator, and restaurant drive-thru intercom systems.

The ZL38004 voice processing platform is a highly integrated solution that helps manufacturers reduce cost and speed design time. The platform integrates a 16-bit dual-channel ADC/DAC with Microsemi voice processor and firmware. Hands-free communication systems must typically operate in locations such as large conference rooms where echo and background noise degrade voice quality.

The platform's firmware delivers excellent performance in double-talk situations. While most solutions deliver only half-duplex operation, the ZLS38502 firmware is able to continuously converge and track changes in the echo path to support full-duplex operation during double-talk situations.

Illustrated below, the ZL38004 chip with ZLS38502 firmware simplifies design and delivers voice quality improvements in hands-free communication systems. The system can cancel up to 128 ms¹ echo tail in wideband, maintain a constant background noise and converge during double-talk situations. The algorithms can reduce noise of up to 30 dB.

1. AEC can support tail lengths with RT60 up to 128 ms in wideband

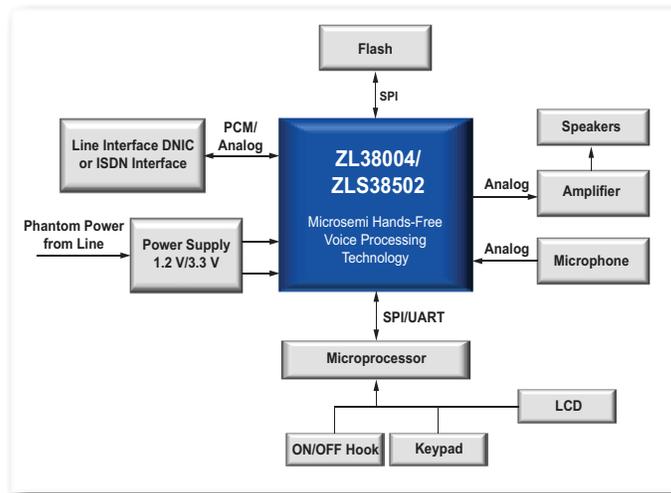


Figure 1: Speakerphone Application

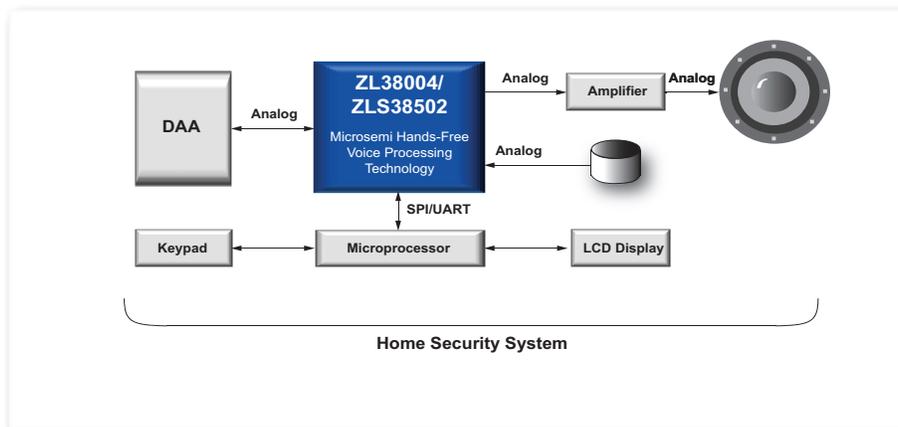
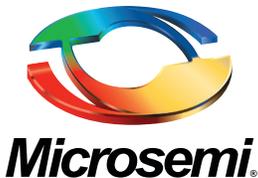


Figure 2: Home Automation Application



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