



## Technology Overview

# QVoice™

noise reduction / echo cancellation software solution

### About QVoice™

**QVoice** is a unique, feature-rich noise reduction and echo cancellation software solution for mobile phones, hands-free car phone systems and headsets. Offering exceptional natural-sounding speech clarity in noisy environments, **QVoice** high-performance algorithms deliver the most effective, efficient, leading quality voice solution available on the market today.

**QVoice** includes adaptive algorithms with fast convergence for bi-directional noise reduction, acoustic echo cancellation and noise-dependent automatic volume control. Designed for single and dual\* microphone input and highly optimized for low resource consumption with a small memory footprint, it provides a tunable solution for a variety of devices.

**QVoice** proprietary technology identifies background noise mixed with signal and intelligently auto-tunes the noise reduction algorithm to cancel different noise types mixed with the signal, including: road/traffic/engine noise, environmental/background music/babble noise and wind noise. Subsequently the speech enhancement algorithm compensates for any adverse effects, resulting in clear natural-sounding speech, even when background noise is dominant.

**QVoice** can be bundled with QSound's **mQFX** 3D stereo enhancement effects suite, offering OEMs a complete voice and music enhancement package, all from a single vendor. With over 20 years proven expertise in digital audio processing, QSound Labs is the only software developer able to provide a full range of voice and audio solutions.

\* Calibration required with customer device

### Product Suite

The **QVoice** suite of voice enhancement technology consists of:

- TX / RX noise reduction and speech enhancement.
- Acoustic echo cancellation.
- Noise-dependent volume control in RX.
- Hearing exposure monitoring and alert in A2DP / HSP

#### Optional

- mQFX audio effects for enhanced music playback



Mobile Phones



Headsets



UMPCs



Computers



Car Systems



### The QVoice Competitive Edge

- Industry leading sound quality
- Advanced DSP-based solution for handsets & headsets
- Crystal clear natural-sounding speech with no metallic effects
- Unsurpassed performance in hostile, noisy environments
- Easy-to-integrate software solution
- Low memory & processing footprint
- Low development costs & rapid time-to-market delivery
- Single-vendor complete voice & audio solution:
  - Simplifies integration/licensing
  - Saves platform resources
- Optimized for CSR BlueCore5-Multimedia family of single-chip ICs
- Optimized for ARM 7/9/11 and ARM Cortex+Neon processors

## Feature Set Description

### ■ Bi-Directional Noise Reduction

- excellent performance with all noise types
- simultaneous noise reduction in TX and RX
- up to 20dB noise attenuation
- noise identification for optimal tuning
- fast convergence with low delay
- integrated speech enhancement
- works well when in tandem with a 2nd NR

### ■ Acoustic Echo Cancellation

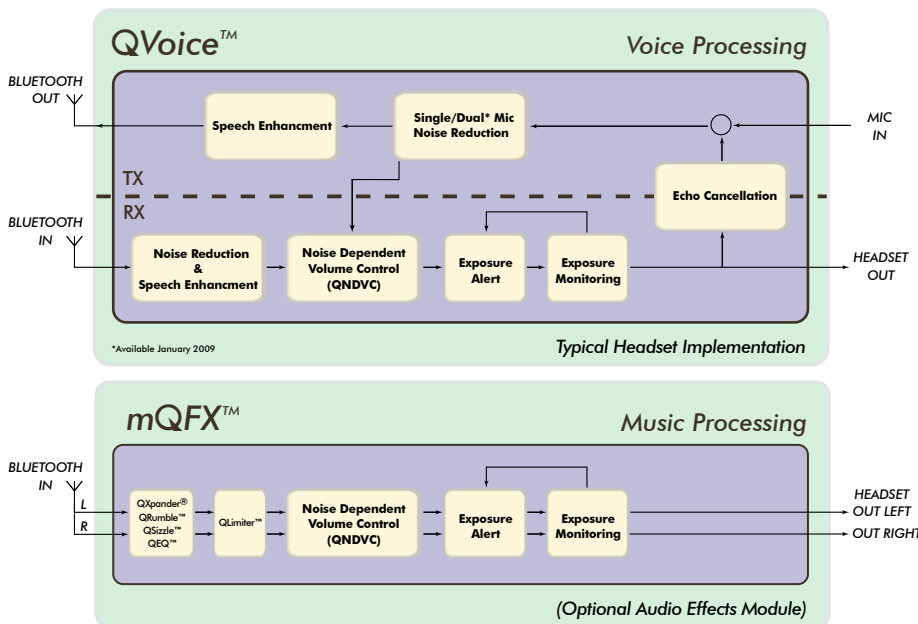
- cancel echos coupled from speaker to mic
- fast convergence & deep echo cancellation
- robust double-talk performance
- processes up to 64msec including echo tail
- handles multiple echos within the frame
- full duplex

### ■ Noise-Dependent Auto Volume Control

- adjusts the volume based on ambient noise
- utilises accurate ambient noise estimation
- smooth and natural transition between levels
- intelligent tracking for optimum voice quality
- avoids startle effects - no sudden changes
- maintains previous signal-to-noise ratio (SNR)
- no need to constantly search for volume buttons

### ■ User Exposure Monitoring and Alert

- continuously monitors acoustic energy through the headset
- calculates accumulative hearing exposure in HSP and A2DP
- configurable loudspeaker setting for precise measurement
- notifies user if pre-defined acoustic energy level is reached
- notification message can be deactivated / reactivated



## Optimization & Integration

Audio solutions by QSound Labs have been rigorously optimized with the participation of our major industry partners focusing on three critical requirements: Quality, Memory Footprint, and Performance.

QSound's comprehensive suite of new voice enhancement technologies are optimised to run on Kalimba DSP and ARM 7/9/11/Cortex+Neon processors. The Master Headset Application combination of audio and voice solutions from QSound are ideal for module selection and speedy integration to deliver new products with unique features.

## Contact Us

**QSound Labs, Inc.**

#102, 2816 - 11th Street NE  
Calgary Alberta Canada T2E 7S7

Tel: +1-403-291-2492

Fax: +1-403-250-1521

Email: [info@qsound.com](mailto:info@qsound.com)

[www.qsound.com](http://www.qsound.com)

