Mobile Phones   **Headsets**   **UMPCs**   **Computers**   **Car Systems**

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.

* Available January 2009

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

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*
- *Soon available for other platforms*

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

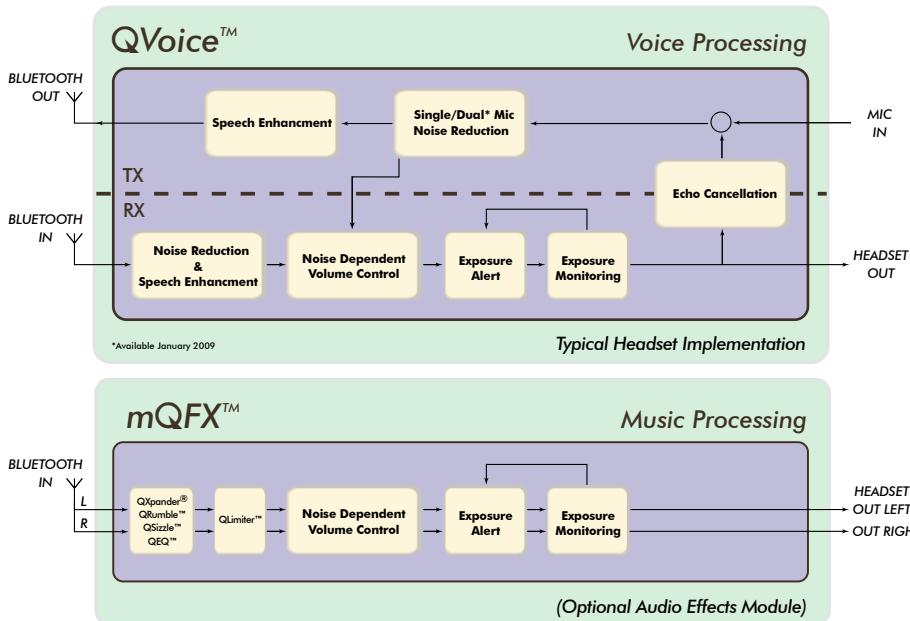- **Acoustic Echo Cancellation**
  - cancel echos coupled from speaker to mic
  - fast convergence & deep echo cancellation
  - robust double-talk performance
  - processes up to 32msec including echo tail
  - handles multiple echos within the frame

- **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

QVoice™ — Voice Processing

BLUETOOTH OUT

Speech Enhancment

Single/Dual* Mic Noise Reduction

TX

RX

BLUETOOTH IN

Noise Reduction & Speech Enhancment

Noise Dependent Volume Control

Exposure Alert

Exposure Monitoring

Echo Cancellation

MIC IN

HEADSET OUT

*Available January 2009

Typical Headset Implementation

mQFX™ — Music Processing

BLUETOOTH IN

L
R

QXpander® QRumble™ QSizzle™ QEQ™

QLimiter™

Noise Dependent Volume Control

Exposure Alert

Exposure Monitoring

HEADSET OUT LEFT
OUT RIGHT

(Optional Audio Effects Module)

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. 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. For more information, please contact QSound Labs.

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TX and RX Channels -- Before   TX and RX Channels -- After

RX Channel -- Noise-dependent Auto Vol Control