



Technology Overview

QVoice™

noise reduction / echo cancellation software solution

About QVoice™

QVoice delivers an advanced suite of proprietary voice enhancements that dramatically improve the quality and clarity of voice communications in a diverse array of applications and operating requirements.

Hand-held, automotive and PC-based communications systems are subject to an assortment of unpredictable noise conditions. Microphone and speaker configurations combine with the surrounding acoustic environment to create multiple challenges for traditional echo cancellation and noise suppression techniques. Applications are subject to highly variable real-world operating constraints from processing delay, to memory and processor load considerations.

QVoice meets the challenge with scalable processing, flexible configuration options and cutting edge technology enabling optimal voice communication performance in each user environment.

QVoice single and dual microphone noise suppression effectively reduces both stationary and non-stationary background noise. Noise suppression can be applied to both transmit and receive audio channels.

QVoice acoustic echo cancellation enables high quality, full duplex communication, while robustly adapting to changing acoustic conditions and echo path distortions.

QVoice supports both "close-talk" (handset) and "far-talk" (speakerphone) applications as well as narrow-band and HD Voice (wide-band and super-wide-band) audio formats.

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

Test Standards

QVoice conforms to all major ITU, 3GPP and VDA objective test standards in rigorous internal and third-party testing.



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
Tensilica HiFi Audio DSP

Feature Set Description

■ Bi-Directional Noise Reduction

- excellent performance with all noise types
- simultaneous noise reduction in TX and RX
- single & beamforming dual mic support
- up to 30dB noise attenuation
- fast convergence with low delay
- integrated speech enhancement
- works well in tandem with a 2nd NR
- improves voice recognition system accuracy

■ Full Duplex Acoustic Echo Cancellation

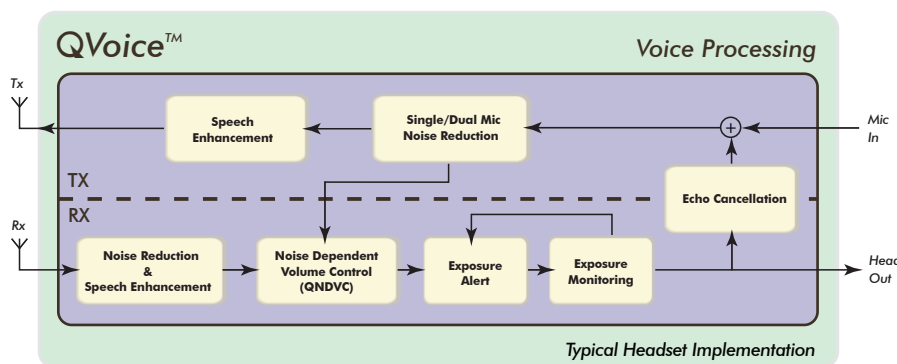
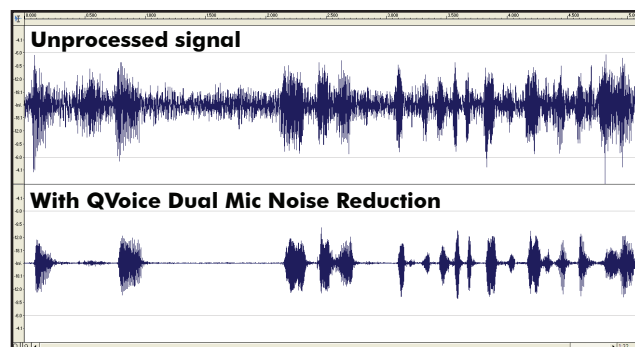
- cancel echos coupled from speaker to mic
- fast convergence & deep echo cancellation
- robust double-talk performance
- 8k and 16k sample rate support
- configurable filter length for all acoustic environments
- robust handling of echo path distortions

■ Noise-Dependent Auto Volume Control

- adjusts RX volume based on ambient noise
- improves voice intelligibility in high noise
- eliminates constant volume re-adjustment
- intelligent tracking for optimum voice quality
- ensures smooth and natural dialog at all times

■ 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

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

QVoice is optimized for the Tensilica HiFi Audio DSP platform.

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