



Technology Summary

microQ[®]

portable digital voice and audio engine

About microQ[®]

microQ is a compact, modular and highly efficient software digital audio engine for mobile devices enabling polyphonic ringtones, 3D game sound and enhanced music playback with multiple effects, as well noise reduction and echo cancellation for voice transmission.

Product Suite

Unmatched by any single vendor, microQ's modular audio suite consists of the following major components:

mQSynth™ Polyphonic Wavetable Synthesizer -- plays polyphonic ringtone files, interactive real-time sound events and game music using digital wavetable instruments. Our Realtime Ringtone Remixer (QR3™) re-authors non-optimized content on the fly to produce consistent, distortion-free output.

mQ3D™ Positional 3D Audio Engine -- places multiple sounds independently in 3D space for interactive gaming. Applicable to arbitrary streams or mQSynth synthesizer channels using native or custom instruments and sound effects. Optional: QEM® environmental modeling (reverberation).

mQFX™ Digital Effects -- enhances music listening with:

QSound Spatial Enhancements

- **QXpander®** 3D stereo sound stage expansion.
- **QVerb™** digital reverberation.

QSound Spectral Enhancements

- **QEQualizer™** parametric spectrum control with presets.
- **QSizzle™** dynamic high-frequency enhancement.
- **QRumble™** dynamic low-frequency enhancement.

QSound Dynamix Controllers

- **QAutoLeveler™** automatic gain control.
- **QXtremeVolume™** handset speaker volume maximizer.
- **QDRC™** dynamic range control.
- **QLimiter™** anti-saturation dynamic range control.

NEW! • **QNDVC™** noise dependent volume control.

QVoice™ Noise Reduction / Echo Cancellation Solution -- offers high-performance, adaptive algorithms for exceptional natural-sounding speech clarity even in noisy environments.



Mobile Phones



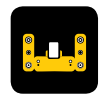
Music Players



Earphones



UMPCs



Docking Stations



The microQ Competitive Edge

- Industry leading, ARM® optimised
- Proven track record and established brand recognition
- Replaces dedicated hardware music synthesizer
- Single-vendor full audio solution:
 - Simplifies integration
 - Saves platform resources
- Selectable, scalable modular components for easy implementation
- Small memory footprint
- High efficiency processing
- Supports earphones and speakers
- Tunable 3D for all narrow geometry speaker configurations

QSoundLabs

Leaders in Digital Audio Innovation



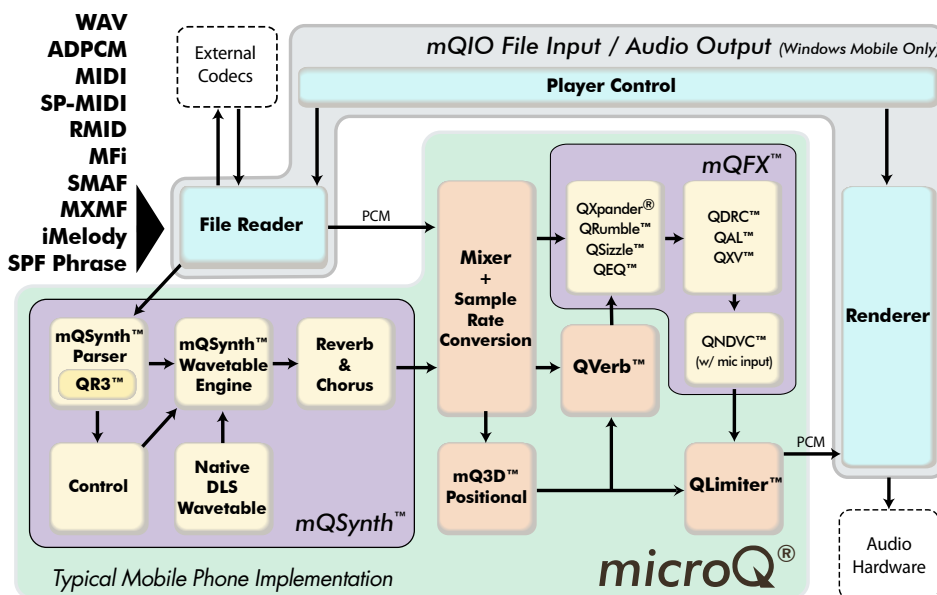
Platforms and Implementations

microQ is written in highly-optimized C++ using fixed-point math, featuring the combination of small footprint and high efficiency that is the hallmark of QSound audio platforms. An optional C interface is also available.

microQ is currently available for DSP and RISC architectures running Linux, Symbian OS®, Nokia® Series 60, and Microsoft® Windows Mobile.

- ARM®7/ARM9/ARM11/ARM Cortex+Neon
- Marvell® PXA300/PXA310
- Qualcomm® MSM 6xxx / MSM 7xxx
- Infineon® MP-E
- CEVA® Teak™/Teak Lite™ DSP cores
- AMD® Imageon™
- Tensilica® HiFi 2 Audio Engine
- TI® OMAP™

microQ can be implemented at various system levels, e.g. within a driver, as a plug-in, or as a user application, and can be provided in the form of object code, or custom ported by QSound Labs to suit your specifications.



ARM® - QSound®

"After evaluation of the QSound microQ technology, we found it offered the best combination of audio quality, performance and memory usage, resulting in a highly competitive solution."

In addition, the modular, component-based architecture creates a flexible solution which addresses the audio requirements of mobile handsets in a more scalable fashion."



Lance Howarth
General Manager

Support for APIs and Standard Formats

microQ renders polyphonic sequenced content (MIDI, SP-MIDI, MXMF, iMelody, MFi v4.0, SMAF-MA2/MA3/MA5/MA7 with LED, Vibration and .SPF Phrases) with its native wavetable synthesizer sample set or by using custom downloadable instrument sounds (DLS, DLS2.0, Mobile DLS).

microQ plays multiple common linear and compressed formats (WAV, PCM, ADPCM).

microQ API support: Vodafone® VFX, JSR-135, JSR-234, OpenSL ES™.

Contact Us

QSound Labs, Inc.

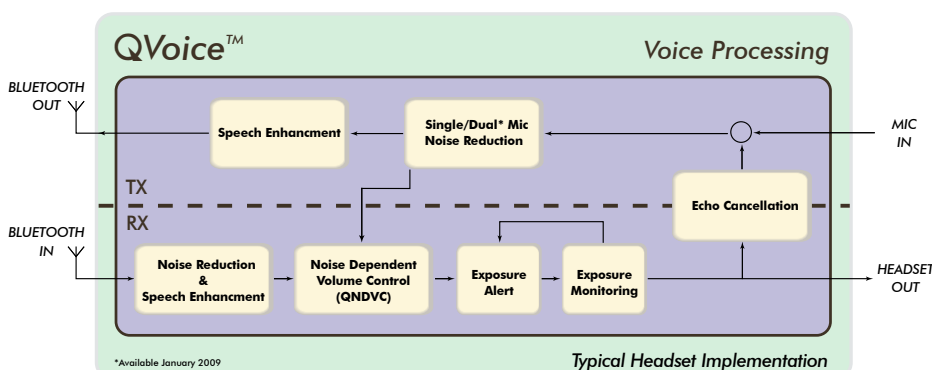
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*Available January 2009