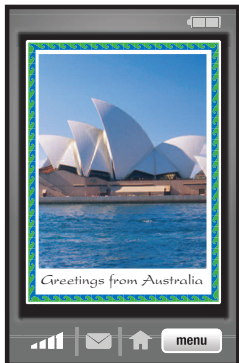
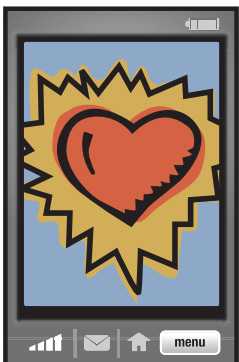


CMX™ Solution

Maximize market opportunities with a cost-effective multimedia solution



Greeting Cards



Screensavers & Wallpapers

Wireless device manufacturers, network operators and content developers are capitalizing on the growing demand for wireless multimedia with CMX™ (Compact Media Extensions™) – a standardized, cost-effective multimedia software solution that enables the delivery of customized multimedia content via mobile handsets.

For manufacturers, CMX is a valuable product-differentiating feature and a complete software solution for wireless multimedia with no additional hardware requirements. The power of multimedia application support can now be added to wireless handsets at a cost far below other multimedia alternatives. For operators, CMX creates service-differentiation opportunities and builds customer loyalty by enabling the most in-demand features and services for mobile devices.

CMX empowers developers to create custom ringtones, animated ringtones, screensavers and wallpapers with time-synchronized multimedia outputs of MIDI-based music, text, graphics, animation and voice. Game developers can take full advantage of all the various CMX-supported audio formats with APIs that enable seamless audio integration into their products. CMX game and application audio support includes additional application-specific features, such as simultaneous playback of up to four MIDI files and four QCELP or ADPCM tracks, which can be triggered by game and user input events.

Content developers can also create compelling multimedia content with QUALCOMM's CMX Studio, available free of charge. The authoring tool enables the precise placement of various audio and graphic elements from an array of compatible formats along the CMX Studio timeline within an intuitive layout window. The authoring tool is continually upgraded to ensure content creation compliance.

For more information, please visit http://www.cdmatech.com/about_us/contact_cmx.jsp.

CUSTOMIZED RINGTONES • KARAOKE • SCREENSAVERS • ANIMATED RINGTONES • GREETING CARDS • PC-QUALITY MUSIC



Karaoke

CMX Chipset Software Features

- Up to 72-polyphony, 128-instrument MIDI wavetable synthesizer with 44 kHz sampling rate, delivering CD-quality sound
- Ability to play back multiple file formats:
 - SP-MIDI and General MIDI levels 1 and 2 (Standard MIDI format)
 - CMF – QUALCOMM's standardized multimedia file format
 - Synthetic music Mobile Application Format™ (SMAF™) audio
 - Extensible Music Format (XMF) and Downloadable Sound (DLS)
 - Melody Format for i-mode (MFi) – (license required)
- Support for MPEG-4 AAC/aacPlus™ on Qtv™-enabled handsets
- Supports SVG, a scalable, power-efficient solution for computer-quality vector graphics
- Interoperability with QConcert™, QUALCOMM's 3D surround sound solution
- Optimized for QUALCOMM's Mobile Station Modem™ (MSM™) chipsets and powered by embedded DSP and ARM® CPU cores
- QDSP4000™ high-performance digital signal processors (select chipsets)
- Supported by familiar BREW® and Java® development environments

CMX™ Solution

CMX Solution Benefits

- Provides a superior software MIDI-based engine capable of playback of multiple file formats
- Delivers rich, interactive multimedia with audio functionality for enhanced infotainment and animation applications with PNG, JPEG, SAF and SVG support
- Enables karaoke applications with graphics, text and audio played simultaneously
- Facilitates audio-enabled user interfaces (UIs), screensavers and animation
- Can be combined with other popular Launchpad™ technologies to provide new handset functionality:
 - QConcert for surround sound audio output
 - SVG graphics for mapping applications with gpsOne™
 - Qcamera™ for messaging applications with the ability to “mix and match” ringtones, pictures, animations, text and audio recordings
- Offers a wide variety of audio features for game developers through QUALCOMM's Q3Dimension™:
 - Enhance games with multiple simultaneous audio tracks playback, triggered by specific game events
 - Add and manipulate custom sounds using our downloadable sound (DLS) solution
 - Place and create sound effects in three dimensional space using QUALCOMM's QAudioFX™ solution

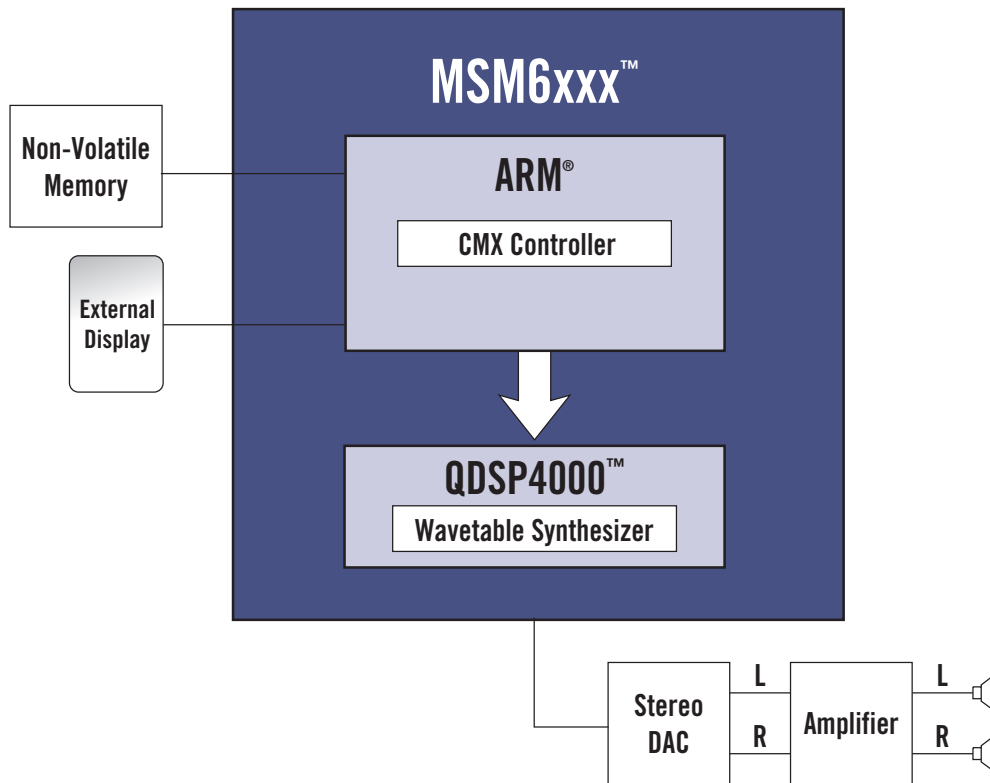
Launchpad Suite

CMX is part of the Launchpad suite of integrated applications technologies, which offers wireless operators and manufacturers a cost-effective, scalable and timely solution for providing advanced wireless data services. Launchpad features power advanced applications and services using multimedia, position location, connectivity and storage capabilities. Select Launchpad features are integrated onto each QUALCOMM chipset.

| QUALCOMM PLATFORMS WITH INTEGRATED CMX SUPPORT | | |
|--|--|--|
| PLATFORMS | FEATURES* | GRAPHICS |
| Enhanced Multimedia | <ul style="list-style-type: none"> • 72 Polyphony • Codecs: QCELP, ADPCM 8,16, 32 kHz • 512kB wavetable, 44 kHz sampling rate • Audio Formats: CMF, SP-MIDI, SMAF, XMF, DLS, MFi • Compatibility with QConcert (spatialized audio) | <ul style="list-style-type: none"> • PNG 8 fps • SAF 10 fps • JPEG 4 fps • SVG |
| Multimedia | <ul style="list-style-type: none"> • 72 Polyphony • Codecs: QCELP, ADPCM 8,16 & 32 kHz • 512kB wavetable, 44 kHz sampling rate • Audio Formats: CMF, SP-MIDI, SMAF, XMF, DLS, MFi • Compatibility with QConcert (spatialized audio) | <ul style="list-style-type: none"> • PNG 5 fps • SAF 6 fps • JPEG 4 fps • SVG |
| Value | <ul style="list-style-type: none"> • 32 Polyphony • Codecs: QCELP, ADPCM 8 & 16 kHz • 128 kB wavetable, 32 kHz sampling rate • Audio Formats: CMF, SP-MIDI, SMAF | <ul style="list-style-type: none"> • PNG 2 fps • SAF 3 fps • JPEG 1fps |

* Features may not be supported on all MSM™ platforms and some require separate licensing fees.

CMX Block Diagram



Go Online

Please visit www.cdmatech.com/chip_select.jsp to view the chipset comparison tool that details specific chipset features. Each chipset in QUALCOMM's platforms has a different combination of features to meet various manufacturer and operator requirements. Many features listed here are common to most, while others are exclusive to a single chipset.

About QUALCOMM

QUALCOMM CDMA Technologies is shaping and creating new ways to communicate. Working with manufacturers and operator partners worldwide, we develop systems that provide the foundation for tomorrow's wireless services while delivering what the market needs today.

Our industry-leading CDMA engineers create detailed reference designs to accelerate testing and deployment for our partners. Our chipsets and systems bring advanced features and functionality to legacy and next-generation networks and devices. With QUALCOMM CDMA Technologies, manufacturers and wireless operators can deliver the products and services the world wants now and be first to market with future developments.



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