

# Sound Synthesis and Streaming Audio Solution

## Benefits

- Differentiate the end product since sound synthesis quality can be determined by leveraging application-specific sound font libraries
- Leverage flexible audio content creation since multiple audio formats are supported in addition to the synthesis engine
- Reduce overall system cost and board space by allowing sound synthesis, audio decoding, and effects processing to occur in one DSP processor
- Future proof audio designs by using the programmable DSP to upgrade sound fonts as necessary for a given application

High-performance audio solutions based on Texas Instruments DSPs offer developers the flexibility to design a variety of high-quality sound generation products. These solutions include powerful DSPs that prove to be the most reliable, scalable and high-performance offerings for a full range of audio designs.

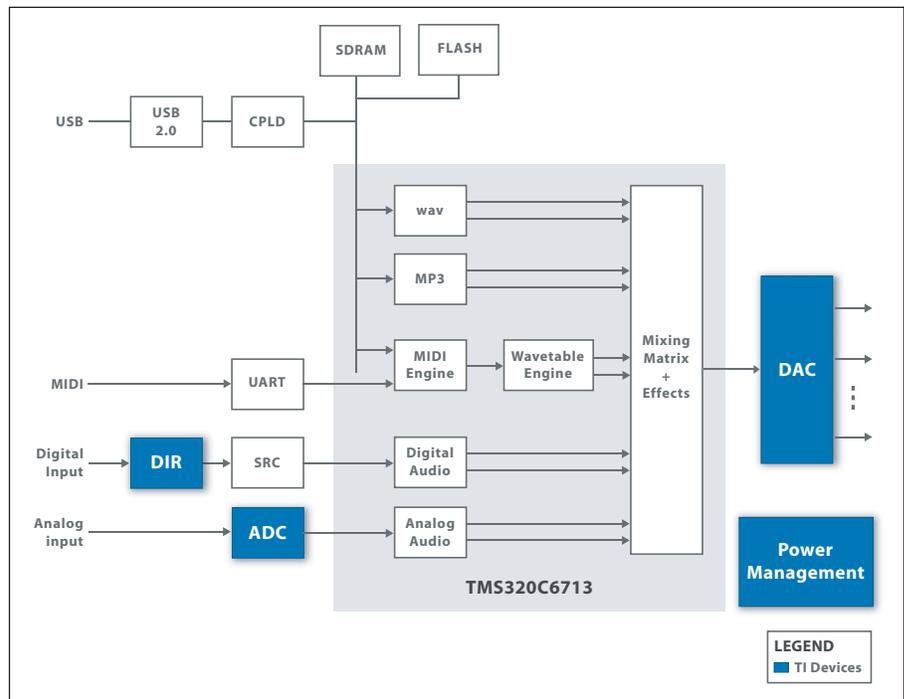
For developers of audio products needing high-quality sound synthesis, Lyrtech's software solution based on a TI TMS320C6713 floating point DSP offers complete and enhanced MIDI synthesizer functions based on proven wavetable synthesis technology. This technology, used by many sound cards and music synthesizers, allows rich and realistic sounding instrument sounds for MIDI music playback or MIDI sequencing. The software solution also supports playback of .wav and .mp3 files and integrates all audio signals into a mixing matrix where they can be processed by multiple effects processes before being output to the speakers. This very flexible software package can easily replace and outperform the functionality found in a variety of fixed function synthesis chipset solutions.



## Target Applications

- Gaming machines
- Karaoke machines
- Arcade machines
- Electronic musical instruments
- Background music systems
- Interactive consoles (such as museum or shopping mall)
- PC sound cards

## System Example: Audio Streaming and Wavetable Solution



# Sound Synthesis and Streaming Audio Solution

## Functional Description

### Hardware

The Sound Synthesis solution from Lyrtech is a software package that is designed and optimized to run on the TI C6713 DSP. This package can be demonstrated on the CPA-II development board available from Lyrtech or can be customized to run on a customer-designed C6713 audio board

### Software

Software supports:

- Up to 128 simultaneous voices for very rich-sounding wavetable synthesis
- Integrated MIDI control
- Flexible audio streaming support for mp3, wav, and ADPCM formats
- Simultaneous decode of multiple audio streams
- High-quality effects like chorus and reverb
- Advanced audio mixer capable of mixing audio samples from multiple audio sources

## Component Selection

Final component selection for a complete hardware system will be determined by the system requirements of the end equipment application. However, TI has a broad portfolio of products from data converters to amplifiers to power management chips that could be leveraged in a complete audio synthesis end equipment. Some of these products are highlighted below:

- TI DSP: TMS320C6713 from Texas Instruments
- TI Analog
  - UCC3809 (Economy Primary Side Controller)
  - TPS5120/TPS5124 (Dual Channel Synchronous Step-Down PWM Controller)
  - TLC5922 (LED Driver with Dot Correction)
  - TPS3809 (Voltage supervisor)
- Class-D Amplifiers (TPA3001D1 and TPA3004D2)
- Digital-to-Analog Converters (DACs)

## Getting Started

### Tools

Lyrtech, with more than 20 years experience in DSP and audio technologies, offers a broad range of development tools and services that include hardware, software tools, engineering services and more:

- Lyrtech C6713-based development boards with audio-specific I/O capabilities (AES-EBU, S/PDIF, ADC/DAC, etc.)
- Lyrtech C6713-based DSP boards with co-processors (CPU, FPGA) available
- Texas Instruments Code Composer Studio™ setup environment
- Lyrtech turnkey engineering services for solution (hardware and software) development

### Documentation

- Technical Reference Manual
- User's Manual

## Contact Information for Questions/Support

To purchase this solution or for more information: [www.lyrtech.com/](http://www.lyrtech.com/) [info@lyrtech.com](mailto:info@lyrtech.com)

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