OVERVIEW

The Lyrtech Professional Audio Development Kit (PADK) is a stand-alone audio digital signal processing development board, based on the brand-new low-cost TMS320C6727™ floating-point digital signal processor (DSP) from Texas Instruments. The PADK is extremely flexible and benefits from more capabilities than most professional audio applications require. Working with such a capable platform accelerates the overall design efficiency and allows developers the liberty to create exactly the type of product they need.

The PADK was also designed to serve as a production-quality reference design. Developers can use it as a base design, then build on it to create a final board. Because of the flexibility of the components used, the PADK can be readily cost-reduced and brought to production. Lyrtech also offers engineering services for customizing final design boards. In this way, the flexibility of the PADK assists developers by easing initial application development then simplifying final production design through straightforward component replacement.

APPLICATIONS

- Professional audio: Audio broadcast, encoding, and studio applications
- Sound and music: Modification and generation
- Embedded sound generation: Games, karaoke, background music, and sound synthesis

KEY FEATURES & BENEFITS

- High-quality BURR-BROWN™ 24-bit resolution ADC (2) and DAC (2), capable of sampling rates of up to 192 kHz for multichannel coding, processing, or sound generation.
- Coaxial and optical 24-bit input and output digital ports capable of sampling rates of up to 192 kHz—ideal for direct digital professional audio application development.
- USB port ideal for high-speed communications to a host computer, which allows streaming audio in real time, downloading large sound banks, and handling any other high bandwidth applications.
- MIDI input, output, and thru ports to interface directly with external musical instruments and controllers.
- Analog port for external control inputs, such as pedals and switches.
- The high-resolution sampling rate converter of the PADK offers the possibility to simultaneously operate at different input and output sampling rates, and to lock to various audio and word clock input sources.

POWERFUL PROCESSING

The Texas Instruments TMS320C6727™ DSP is tuned for applications where audio quality and performance are critical. At 300 MHz and 1800 MFLOPS, it outperforms most available DSP currently available.

- The 64 internal registers improve automatic compiler optimizations, increase tight-loop performance, and reduce the overall number of necessary accesses to the memory.
- The four enhanced floating-point add instructions, in parallel, boost FFT processing by 20%.
- The dMAX DMA engine offloads the processor for specialized off-chip memory accesses, commonly used in effects processing.
- 32 x 64-bit operations improve the efficiency of high-precision audio processing for high sampling rate, low-frequency applications. They still support 32-bit fixed-point operations, to ease the porting of existing legacy code.

Developers can profit from this performance to deliver the most realistic audio experience and incorporate unique capabilities like automatic room correction, speaker virtualization, audio and voice enhancement, music synthesis, and more into their professional audio and mass-market products.

SOFTWARE DEVELOPMENT TOOLS

The PADK is fully compatible and integrated with Texas Instruments Code Composer Studio™ and eXpressDSP™ development tools. The software supplied with the PADK is also compatible with Texas Instruments CSL and DSP/BIOS™. Finally, the PADK comes fully loaded with drivers for all peripheral elements of the board, as well as application examples and an Audio Streaming Wavetable Synthesis Solution demonstration that truly showcases the full potential of the PADK and its TMS320C6727™ DSP.
EXCLUSIVE MULTIFORMAT AUDIO STREAMING AND WAVETABLE SYNTHESIS SOLUTIONS

The optional Audio Streaming and Wavetable Solution software, is based on Texas Instruments TMS320C6727 floating-point DSP. This software provides an optimized solution for MIDI sound synthesis, based on wavetable technology, to musical instrument and professional audio product developers. The software also includes an optimized multi-channel audio streaming and playback solution capable of decoding audio file such as ADPCM, WAV, and MP3 format files. The TMS320C6727 is capable of processing up to 128 simultaneous polyphonic voices of sound synthesis and up to 15 simultaneous MP3 decodes with full capabilities of mixing matrix and audio effects processing. The wavetable synthesis IP is available for licensing from Lyrtech for use in production of equipment requiring high-quality embedded audio capabilities.

Benefits of the solution

- Compact and inexpensive, for enhanced MIDI music synthesis and audio playback in embedded applications.
- Cost-effective, DSP-based solution, when compared to sound cards or CPU software emulations.
- Complete control over instrumental sound and audio effects generation.
- Multiple standard sound sources (MIDI, WAV, MP3, ADPCM, etc.) can be programmed and streamed in real time.
- Mixing matrix capable of merging multiple audio sources of different formats, and sampling rates compatible with MIDI, WAV, MP3, analog, and digital audio.
- Can replace current or discontinued wavetable solutions from other manufacturers.

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ABOVE US

Lyrtech (www.lyrtech.com) is a recognized player in the worldwide digital signal processing (DSP) market with more than 20 years of experience in the delivery of advanced technology solutions in Asia, Europe and the Americas. Lyrtech is the one-stop place for electronic design, prototyping, manufacturing and delivery of a full range of value-added products and services, which range from off-the-shelf DSP/FPGA development platforms to turnkey project solutions and electronic manufacturing services (EMS). The company works in partnership with industry leaders such as Altera, StarCore, Texas Instruments, The MathWorks, and Xilinx. Lyrtech delivers unsurpassed quality and support to its large OEMs customer base, which includes many prestigious names such as Nokia, Nortel, Fujitsu, Sony, GM, Honeywell, Toyota, Honda, BAE Systems and EADS.

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