CONEXANT

CX20805

High-Performance Low-Power Digital Audio Signal Processor

The CX20805 is a 32-bit dual core Digital Signal Processor (DSP), designed using Conexant Audio Processing Engine (CAPE) cores. The CX20805 audio processor offers customers programmability and flexibility in their designs by providing a cost- effective architecture which needs high performance and low power. CX20805 is the first high performance, low-power audio DSP in the audio market that offers over 800 MIPS(1) to support computationally intensive audio processing algorithms with large on-chip memory 520KB SRAM/352KB ROM and capable of supporting all major high sampling rates through various audio interfaces to external SoCs and Analog Mixed Signal chipsets.

The device features support for up to four digital microphone inputs, support for dual bi-directional I^2S, PCM, S/PDIF transmit and receive with independent sampling rates, and a range of digital input/output channel selections for flexible routing and mixing. Different audio sampling rates ranging from 8 kHz to 96 kHz are generated directly from the master clock without the need for external PLL. The device can be controlled and configured by both read and write capability through I^2C and Serial Peripheral Interface (SPI). The USB interface supports both High speed and Full speed, and is USB2.0 Audio Class compliant for both data and control. An integrated on-chip 128-bit AES decoding engine is present for copyright protection and rendering full-rate, lossless Blu-ray media content. There are six timers/counters on chip which can be used for different application based requirements.

The device also has a Conexant Audio Bus (CAB) interface which has been specially developed to handle high data rate transfer when interfacing with HD Audioor external analog codecs. There are two on-chip tri-color PWM LEDs and a PIC controller which is retaskable to support various communication protocols over 24 programmable GPIOs.

The device integrates advanced low-power techniques, such as DC-DC converters, Power Gating, Power Retention, Low-Vdd Standby, Dynamic Voltage Scaling (DVS) and Adaptive Voltage Scaling (AVS), which employ voltage control to manage power. In addition, frequency scaling mechanisms can also be used to reduce the power consumption further.

CX20805 comes bundled with advanced signal processing routines, free of royalties, for customers interested in developing their own proprietary algorithms for different applications. This package includes CAPE optimized implementations of filter banks, Equalizers, Sampling Rate Converter (SRC), a small footprint Operating System (etc.).

The Configuration Toolbox allows for fast configuration of the various signal processing algorithms and performance optimization. A complete evaluation kit with reference board and all the necessary technical documentation and software is available. An efficient C compiler is also available for customers interested in programming the CAPE Cores.

Samples are available in a small footprint 9x9, 116-pin Dual Row QFN packaging along with Evaluation kits.

Applications

- Unified Communication Peripherals
- Telepresence/Unified Communication Device
- All-in-One Speakers/Docking System
- LCD Display/Sound Bar
- Home Automation/Intercom
- Wi-Fi® Phone/Smart Phone Docking Systems
- Mobile Internet Devices, Portable Navigation Devices, Portable Media Players
- Multimedia IP phone
- Embedded applications
- Full-duplex Hands-free Telephony
- A/V receivers, DVD
- Receivers, Set-top Box
- After-market Automotive Amplifiers and Entertainment systems

Bundled DSP Algorithms (Royalty Free)

- Fast Fourier Transforms (FFT)
- Finite Impulse Response (FIR) filters
- Infinite Impulse Response (IIR) filters
- 128 band Analysis and Synthesis Filterbanks
- Dual Knee Dynamic Range Compression (DRC)
- Automatic Gain Control (AGC)
- Sampling Rate Converter (SRC & ASRC)
- Equalizer (EQ) with flexible number of bands
- Downmixer (Flexible number of channels)
- Amplifier and Mixer (Side Tone Generation)
- Signal generator
- Cyclical Buffering Mechanisms

(1) Conexant rates its DSPs based on the chips using standard voltage with 10 percent margin. DSP cores are often rated at the typical conditions with overvoltage and no margin. Under these conditions, CX20805 could easily exceed 1000 MIPS.

Part Number CX20805

Description High-Performance Low-Power Digital Audio Signal Processor

CX20805 Features

DSP

- Dual core 32-bit DSP running at 200 MHz, which yields 800 MIPS
- DSP has separate X and Y data and P code memory
- Fixed point DSP, with floating point assist
- Each core is dual MAC and dual memory access.
- Each MAC supports 32x24-bit multiplication and 64-bit accumulators.

On Chip Memory

- Large embedded memory 520KB SRAM and 352KB ROM.
- Separate X and Y data and P code memory spaces.

Peripherals

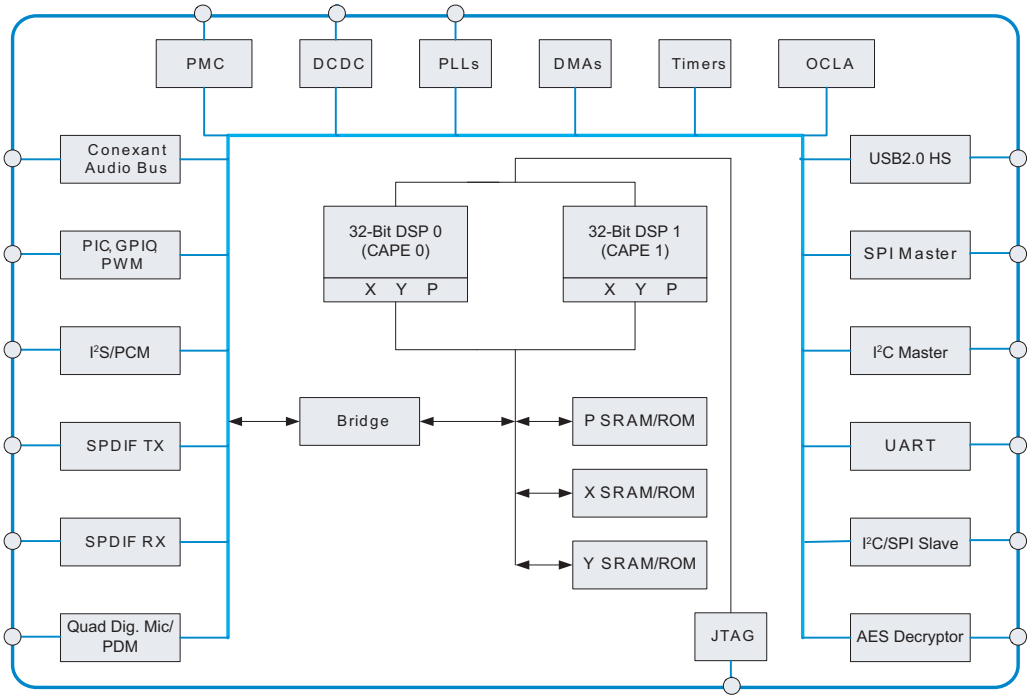
- High Speed USB2.0 Device, supporting up to eight endpoints
- Quad Digital microphone PDM interface
- SPDIF Transmitter and SPDIF receiver
- Full duplex stereo I^2S/PCM
- Custom Conexant Audio Bus (CAB) to connect to multi-channel Conexant audio devices

Peripherals (continued)

- Six 32-bit timers/counters
- Serial peripheral interface (SPI) Master and Slave
- Inter-Integrated Circuit (I^2C) Master and Slave
- 1 UART Serial interface
- Dedicated peripheral and memory-to-memory DMAs channels
- Interrupt controller
- 24 Flexible I/Os (FlexIO) fully programmable through integrated PIC processor
- 2 sets of 3 LED PWM drivers
- 6 dedicated general-purpose I/Os (GPIOs),
- Dedicated AES128 decryption engine.
- Debug/JTAG interface and On chip logic analyzer
- On-chip programmable PLLs
- Advanced power management

Software

- Small footprint Real time Operating System
- Configuration Toolbox
- Details of DSP algorithms coming soon



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