







Speakers-on-a-Chip with On-chip Voice/Audio DSP, Integrated I²C/USB Codec, and Mono Class-D Amplifier CX20706

Conexant's portfolio includes a comprehensive suite of semiconductor solutions for communications and consumer applications.

The CX20706 features a proprietary on-chip Digital Signal Processor (DSP), Codec, Mono Class-D amplifier, USB, UART, and I²C interfaces, high performance 24-bit DAC's and ADC's, a range of digital and analog input/output channel selections for flexible routing and mixing, and a stereo capless headphone driver in a cost-effective singlechip package. The device is one of Conexant's Speakers-on-a-Chip (SPoC) embedded audio solutions for convergence audio entertainment and voice communication applications. The solution features a suite of turnkey audio and voice enhancement algorithms designed for Unified Communication peripherals such as headsets, handsets, desk phones, speakerphone, and conferencing systems. The CX20706 is compliant with Microsoft Office Communicator peripheral requirements. This product is part of the CX2070x SPoC family, which includes CX20702, CX20703, CX20704, CX20705, CX20707 and CX20709.

The device features multiple high performance 24-bit DACs for 2 CH PWM output, multiple 24-bit high performance ADCs supporting mono or array microphones and up to two stereo line inputs, capless headphone output or single-ended/differential lineoutput, and a range of digital and analog 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 power-efficient mono Class-D amplifier drives a maximum of 2.5 W (average) from the integrated amplifier. The USB interface supports full speed, and is USB 2.0 Audio Class compliant for both control and data.

The on-chip Digital Signal Processor (DSP) runs a suite of innovative Conexant proprietary voice processing algorithms and audio post processing effects that dramatically improves sound quality and frees-up processing power for other applications without compromising on cost and future firmware scalability. Key audio innovations include Subband Acoustic Echo Suppression and Cancellation, Stereo Beam-forming, Noise Reduction, Dynamic Loudness Adapter, Mic Auto Gain Control, Digital Equalizer, and Dynamic Range Compression. The embedded SPoC Configuration Toolbox allows for fast configuration and performance optimization.

The CX20706 turnkey solution eliminates the need for a multiple-chip reference design, making it easy and economical for manufacturers to design products for high quality Unified Communication applications. A complete evaluation kit with reference board and all the necessary technical documents and software is available.

The SoC is packaged in an environmentally-friendly, RoHS/Green-compliant 76-pin QFN (Quad Flat No leads) package.

Applications

- Unified Communication peripherals
 - Headset
 - Handset
 - Desk Phone
 - Speakerphone
 - Conferencing System



Distinguishing Features

- 24-bit DAC/ADC, SNR 102 dB, THD 92 dB at 48 kHz 3.3 V
- Programmable on-chip proprietary DSP
 - Subband acoustic echo suppression and cancellation
 - Stereo beam-forming
 - Noise reduction
 - Dynamic loudness adaptor
 - Mic auto gain control
 - Digital equalizer (10 bands/channel)
 - Dynamic range compression
- USB 2.0 Audio Class compliant interface (full speed data and control)
- One 2-wire I²C or 4-wire SPI slave, or UART interface for external MCU
- 2.5 W BTL mono Class-D speaker amplifier
- Two microphone interfaces with on-chip bias supply
- Flexible power management
- · Audio sample rate: 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48, 64, 88.2, 96 kHz

Part Number CX20706

Description

Speakers-on-a-Chip with On-chip Voice/Audio DSP, Integrated I²C/USB Codec, and Mono Class-D Amplifier

CX20706 Features

CODEC

- Compliant Microsoft Office Communicator peripheral requirement
- Pass TIA-920 test requirement
- USB 2.0 Compliant Audio Class interface
- UART interface for external MCU
- Eight GPIO pins
- 2.5 W BTL Mono Class-D speaker amplifier
- Single-ended or differential stereo analog audio input
- Two microphones interfaces with on-chip bias supply
- Integrated 50 mW headphone driver with jack sense
- Single-ended or differential line out
- 24-bit DAC/ADC, SNR 102 dB, THD 92 dB at 48 kHz 3.3 V
- Audio sample rate: 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48, 64, 88.2, 96 kHz
- 90 dB dynamic range with 0.01 percent THD+N at 4 Ω load
- Spread Spectrum for filter-less, low EMI output
- 10-bit ADC multiplexed to support analog volume potentiometer and DC level detection

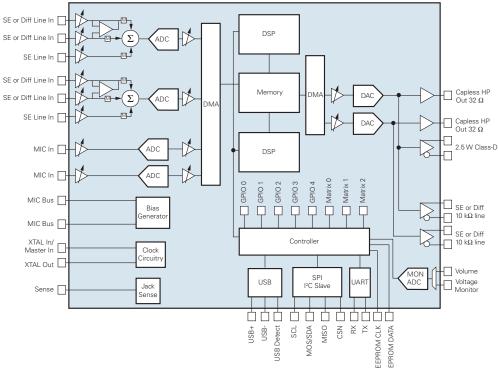
- Flexible power management
- · Variable master clock rates

DSP

- Subband acoustic echo suppression and cancellation
- Stereo beam-forming
- Noise reduction for inbound speech (far end) and outbound speech (near end)
- Dynamic loudness adaptor
- Mic auto gain control
- Digital parametric equalizer (10 bands/channel)
- Dynamic range compression

SPoC Configuration Toolbox

- Fast configuration tool via USB-to-I²C from PC
- Device configuration and DSP parameter adjustment
- Output log for convenient MCU programming



CX20706 Interface Diagram

The CX20706 is offered in a 76-pin QFN package

Conexant Product Portfolio

Conexant's comprehensive product portfolio includes solutions for imaging, audio, embedded modem and video surveillance applications.

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