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GOLDEN MOUSETRAP Best New Products AWARDS FINALIST 2010

CONEXANT

Speakers-on-a-Chip with On-chip Audio DSP, Integrated I^2S/I^2C/USB Codec, and Class-D Amplifier

CX20705

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

The CX20705 is one of Conexant's Speakers-on-a-Chip (SPoC) embedded audio solutions for designing 2.1 Channel audio entertainment applications. The device features a proprietary Digital Signal Processor (DSP), Codec, stereo 2.5 Watt Class-D amplifier, capless headphone driver, digital Crossover, and I^2S, USB, and I^2C interfaces in a cost-effective single-chip package. The solution features a suite of turnkey audio post-processing effects specifically designed for 2.1 Channel audio entertainment applications such as Smartphone/iPOD docking systems and All-In-One speakers. This product is part of the CX2070x SPoC family, which includes CX20702, CX20703, CX20704, CX20706, CX20707 and CX20709.

The device features multiple high performance 24-bit DACs for 2.1 Channel speaker output, multiple 24-bit high performance ADCs supporting up to three stereo line inputs, capless headphone output, support for bi-directional I^2S, PCM, S/PDIF-out with independent sampling rates, and a range of digital and analog input/output channel selections for flexible routing and mixing. The integrated digital crossover supports sub-woofer configuration. 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 Class-D amplifier drives a maximum of 2.5 W (average) stereo from the integrated amplifier. The SPoC can be controlled and configured by both read and write capability through I^2C and Serial Peripheral Interface (SPI). The USB interface 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 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 Equalizer, Dynamic Range Compression, Digital Crossover, and 3D effects. The embedded SPoC Configuration Toolbox allows for fast configuration and performance optimization.

The CX20705 turnkey solution eliminates the need for a multiple-chip reference design, making it easy and economical for manufacturers to design products for high quality audio 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

- 2.1 Channel Smartphone/iPOD docking systems
- 2.1 Channel All-in-One PC speaker

Distinguishing Features

- 24-bit DAC/Four ADC, SNR 102 dB, THD - 92 dB at 48 kHz 3.3 V
- Programmable on-chip proprietary DSP
  - Digital equalizer (10 bands/ channel)
  - Dynamic range compression
  - Digital Crossover
  - 3D Expander (Phantom mode and Immersion mode)
- USB 2.0 Compliant Audio Class Interface
- One 2-wire I^2C or 4-wire SPI slave interface for external MCU
- 3-wire digital audio I/O (I^2S/PCM/SPDIF), supporting half-duplex receive-only traffic
- Stereo 2.5 W BTL Class-D speaker amplifier
- 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 CX20705

Description Speakers-on-a-Chip with On-chip Audio DSP, Integrated I^2S/I^2C/USB Codec, and Class-D Amplifier

CX20705 Features

CODEC

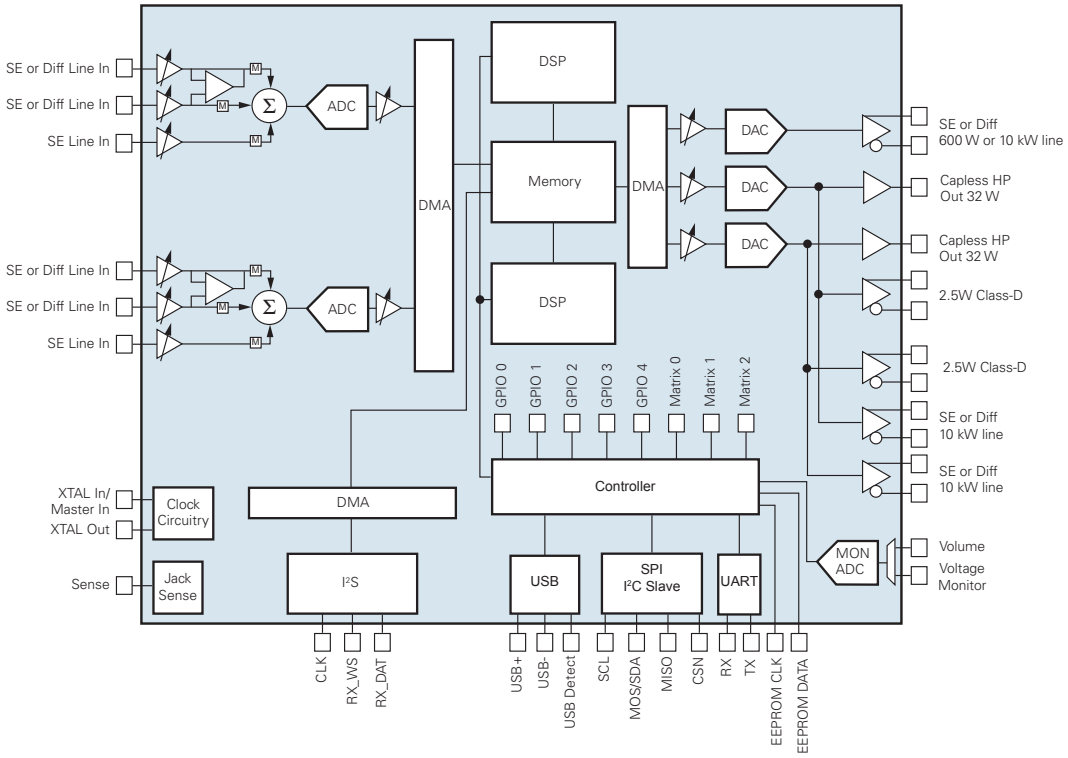
- 3-wire digital audio I/O (I²S/PCM/SPDIF), supporting half- duplex receive-only traffic
- One 2-wire I²C or 4-wire SPI slave interface for external MCU
- USB 2.0 Compliant Audio Class interface
- Eight GPIO pins
- Stereo 2.5 W BTL Class-D speaker amplifier
- Single-ended or differential stereo analog audio input
- Integrated 50 mW headphone driver with jack sense
- 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 0.01percent 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 cock rates

DSP

- Digital equalizer (10 bands/channel)
- Dynamic range compression
- Digital Crossover
- 3D Expander (Phantom mode and Immersion mode)

SPoC Configuration Toolbox

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



CX20705 Interface Diagram

The CX20705 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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Doc# PBR-202397

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