

CX20709

USB/I²S Audio CODEC, Audio/Voice DSP, Stereo Class-D, Headphone Driver

Overview

The CX20709 is one of Conexant's Audio/ Voice DSP CODEC family solutions with highly integrated hardware DSP, CODEC, Class-D amplifier, USB, I²S, S/PDIF, and I²C interfaces. The solution features a suite of turnkey audio and voice enhancement algorithms designed for convergence audio entertainment and voice communication applications, such as PC Docking System/ Sound-Bar, Portable Multimedia/Navigation Devices, Smart Home Intercom System, Media IP Phone, and Unified Communication Peripherals.

The CX20709 offers multiple digital data and control I/O for flexible peripheral or MCU/ MPU connectivity. The device features one 4-wire and one 5-wire digital audio interface, which can be mixed or multiplexed to support bi-directional I²S, PCM, and S/PDIF. The device can be controlled and configured by both read and write capability through I²C and SPI. The device features a USB 2.0 Compliant Audio Class interface (full-speed for data and control) and a UART interface for the external MCU/MPU interface.

The device integrates three highperformance 102 dB SNR, 24-bit DACs for 2.1CH speaker output, capless headphone output, and single-ended/differential lineoutput. The analog input paths feature four high performance, 24-bit ADC supporting up to four microphones or three stereo Line-Inputs. 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 integrated Class-D stereo amplifier operates at 5 V or 3.3 V with an optional maximum power of 2.8 W at a 4 Ω load. For intercom application, the mono line-out supports 600Ω drivers, which can drive the isolation transformer directly without an external operational amplifier.

The on-chip DSP is designed to run a suite of Voice Processing Algorithms and Audio Post Processing Effects offered by Conexant. The device features Conexant's soundbar algorithm for USB 5.1 channel sound-bar enhancement. The audio designer has the ability to adjust and optimize performance on the target system by using the SPoC Configuration Toolbox.

The CX20709 operates at supply voltages down to 3.3 V for analog and 1.8 V for the digital core. An advanced power management scheme can be configured to achieve <7.55 mW in sleep mode.

Applications

- PC Speakers System
- LCD Display/SoundBar
- ◆ Home Automation/Intercom
- ◆ PND/PMP
- Multi Media IP Phone
- Telepresence/Unified Communication Device
- Embedded Applications

Ordering Number	Part Number	Package	Description
DSAC-L709-21CH	CX20709-21Z	76QFN	
DSAC-L709-12CH	CX20709-12Z	76QFN	Not recommended for new design
CX20709-EVK2	CX20709-EVK2		CX20709-21Z Evaluation Kit
CX20709-EVK2-IN	CX20709-EVK2-IN		CX20709-21Z Intercom Daughter Board
All devices are lead-free (Pb Free) and RoHS compliant			

Part Number CX20709

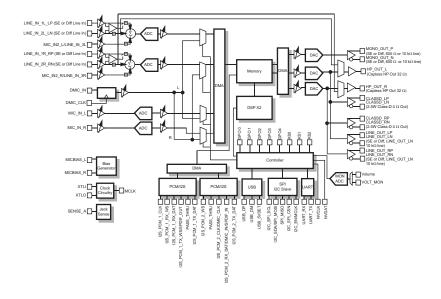
Description USB/I²S Audio CODEC, Audio/Voice DSP, Stereo Class-D, Headphone Driver

CODEC Features

- 4-wire and 5-wire digital audio I/O (I²S/ PCM/SPDIF), supporting full duplex independent sampling rates, master clock for optional PCM/I²S slave codec (SPDIF-in available in CX20709-21Z)
- One 2-wire I²C and one 4-wire SPI slave interface for external MCU
- USB 2.0 Compliant full speed UAC Interface
- Supporting dual USB playback end points (available in CX20709-21Z)
- Stereo Digital Microphone, up to 12 MHz clock rate (available in CX20709-21Z)
- Eight GPIO pins
- 2.8 W x 2 BTL filter-less stereo Class-D Speaker Amplifier
 - Low EMI Class-D amplifier output with Spread Spectrum and common mode scrambler
- Integrated 50 mW headphone driver with jack sense
- Single-ended or differential line output

- Separate mixed mono line-output for sub-woofer or intercom usage
- Three single-ended stereo or one differential stereo analog audio input
- Up to 4 microphone interfaces with onchip bias supply (available in CX20709-21Z)
- 24-bit DAC/ADC, SNR 102 dB, THD -92 dB at 48 kHz 3.3 V
 - In DSP mode, the processing will be limited the input and output to 16-bit effective resolution
- Audio sample rate: 8,16, 22.05, 24, 32, 44.1, 48, 88.2, 96 kHz
- 90 dB Dynamic Range with 0.1% THD+N át 4 Ω load
- 12-bit ADC multiplexed to support analog volume potentiometer and DC level detection
- Flexible Power Management
- Variable master clock rates
- Configurable On-Chip proprietary Voice/Audio Processing
 - Subband Acoustic Echo Cancellation

- **Dual Microphone Beam Forming**
- Noise Reduction
- Dynamic Loudness Adaptor
- Microphone Automatic Gain Control
- Subband Line Echo Cancellation (2-way intercom applications)
- Digital Equalizer (10 bands/ channel)
- Dynamic Range Compression 4th Order Digital Crossover for Subwoofer Line-out
- Conexant sound-bar algorithm for USB 5.1 channel sound-bar enhancement (available in CX20709-21Z)
- **SPoC Configuration Toolbox**
 - Fast configuration via USB-to-I²C from PC
 - Data path, I/O setup, and DSP parameter adjustment
 - Output log for convenient MCU programming



Functional Block Diagram

Conexant Product Portfolio

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

© 2012 Conexant Systems, Inc. All Rights Reserved. Conexant and the Conexant logo are registered trademarks of Conexant Systems, Inc. All other trademarks are owned by their respective owners. Although Conexant strives for accuracy in all its publications, this material may contain errors or omissions and is subject to change without notice. THIS MATERIAL IS PROVIDED AS IS AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANT ABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. Conexant shall not be liable for any special, indirect, incidental or consequential damages

as a result of its use.

www.conexant.com

General Information: U.S. and Canada: (888) 855-4562 International: 1+ (949) 483-3000 Headquarters 4000 MacArthur Blvd. Newport Beach, CA 92660

Doc# PBR-202964

Conexant products are not intended for use in medical, lifesaving or life sustaining applications. Conexant customers using or selling Conexant products for use in such applica tions do so at their own risk and agree to fully indemnify Conexant for any damages resulting from such improper use or sale.

The following are trademarks of Conexant Systems, Inc.: Conexant® and the Conexant C symbol, SmartAudio, SmartJack, SmartCD, and SmartDAA®. Product names or services listed in this publication are for identification purposes only, and may be trademarks of third parties. Third-party brands and names are the property of their respective owners. For additional disclaimer information, please consult Conexant's Legal Information posted at www.conexant.com, which is incorporated by reference.

Reader Response: Conexant strives to produce quality documentation and welcomes your feedback. Please send comments and suggestions to tech.pubs@conexant.com. For technical questions, contact your local Conexant sales office or field applications engi-

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Interface - CODECs category:

Click to view products by Conexant manufacturer:

Other Similar products are found below:

CS4205-KQZ ZL38015QCG1 MAX98090AEWJ+T WM9713CLGEFLV LE58QL061BVC MAX9867ETJ+G3U ADAU1777BCBZRL WM8944BECS/R TDA7293V-E WM8998ECS/R WM8778SEDS/V CS42L73-CRZR WM8750CJLGEFL STA529Q SSM2603CPZ-REEL TLV320AIC14IDBT TLV320AIC23BIPWRQ1 TLV320AIC23IPW TVP5151PBSR MAX98090BETL+ MAX98089ETN+ MAX98089ETNT TLV320AIC34IZASR TLV320AIC3262IYZFR SA612AD/01.112 ADAU1372BCPZ-RL MAX98090AETL+ MAX9880AETM WM8962ECSN/R TLV320DAC3203IRGER WM8904CGEFL/RV 6PAIC3106IRGZRQ1 CS42436-DMZ TSCS25A3X1NDGXZAX BU94502CMUV-E2 TDA8932BT/N2.112 TDA8954J/N1.112 ICS512MLF 92HD73C1T5PRGIC1X 92HD73C1X5PRGXC1X SSM2167-1RMZ AD1836AASZ AD1836ACSZ AD1928YSTZ AD1937WBSTZ AD1938WBSTZ AD1938WBSTZ AD73311ARSZ AD73311ARZ AD73311LARUZ