The on-chip DSP is designed to run a suite of VPAs and audio post processing effects offered by Conexant. The device features Conexant's soundbar algorithm for USB 5.1 channel soundbar enhancement. The audio designer has the ability to adjust and optimize performance on the target system by using the SPoC configuration toolbox.

Applications
- PC speakers system
- LCD display/soundbar
- Home automation/soundbar
- PND/PMP
- Multimedia IP phone
- Telepresence/Unified Communication device
- Embedded applications

Key Features
- Four-wire and five-wire digital audio I/O (I2S/PCM/S/PDIF) that supports full-duplex independent sampling rates and a master clock for an optional PCM/I2S slave CODEC (S/PDIF-in available in CX20709-21Z)
- One two-wire I2C and one four-wire SPI slave interface for an external MCU
- USB 2.0 compliant full-speed UAC interface
- Single-ended or differential line output

System Block Diagram
Additional Features

- Supports dual USB playback endpoints (available in CX20709-21Z)
- Stereo digital microphone, up to a 12MHz clock rate (available in CX20709-21Z)
- Eight GPIO pins
- 2.8W x 2 BTL filterless stereo class-D speaker amplifier—Low EMI class-D amplifier output with spread spectrum and common mode scrambler
- Integrated 50mW headphone driver with jack sense
- Separate mixed mono line-output for subwoofer or intercom usage
- Three single-ended stereo or one differential stereo analog audio inputs
- Up to four microphone interfaces with on-chip bias supply (available in CX20709-21Z)
- 24-bit DAC/ADC, SNR 102dB, THD–92dB at 48kHz 3.3V—In DSP mode, the processing limits the input and output to a 16-bit effective resolution
- Audio sample rates of 8kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz, 88.2kHz, and 96kHz
- 90dB dynamic range with 0.1% THD+n at a 4Ω 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
  - Sub-band AEC
  - Dual microphone beam forming
  - Noise reduction
- Dynamic loudness adaptor
- Microphone AGC
- Sub-band line echo cancellation (two-way intercom applications)
- Digital equalizer (10 bands/channel)
- Dynamic range compression
- Fourth order digital crossover for subwoofer line-out
- Conexant soundbar algorithm for USB 5.1 channel soundbar enhancement (available in CX20709-21Z)
- SPoC configuration toolbox
  - Fast configuration through USB-to-I2C from a PC
  - Data path, I/O setup, and DSP parameter adjustment
  - Output log for convenient MCU programming

Ordering Information

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<th>Ordering Part Number</th>
<th>Part Number</th>
<th>Description</th>
<th>Package</th>
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<td>CX20709-21Z</td>
<td>USB/I²S Audio CODEC</td>
<td>76QFN</td>
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<td>CX20709 EVK2 IN</td>
<td>CX20709-21Z Intercom Daughterboard</td>
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Note: All devices are lead-free (Pb-free) and RoHS compliant.

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