

CX2077x USB Audio Codec IC with Integrated DSP and Tri-color PWM LED Driver

Innovative cost-effective single-chip solution enables superior audio

Conexant's CX2077x is the first USB audio codec Integrated Circuit (IC) product family that incorporates the functionality of a digital audio/ voice processor, USB audio codec, and Tricolor Pulse-Width Modulator (PWM) driver, and digital audio interfaces in one cost-effective, single-chip package. The award-winning Digital Signal Processor (DSP) runs a suite of turnkey audio and voice algorithms that greatly enhances the voice and audio experience. The devices are part of Conexant's embedded audio solutions and are specifically designed for USB audio peripherals, including headsets, headphones, and microphones. The CX2077x product family includes CX20773, CX20774, and CX20776.

The on-chip 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 Cancellation, Dynamic Range Control, Inband

Microphone Noise Reduction, 3D, and Microphone Auto Gain Control.

Conexant's innovative CX2077x product family contains an industry-first internal tri-color RGB (red, green, blue) PWM driver and controller. Each LED output contains an 8-bit resolution PWM controller for brightness and dimming control, enabling designers to create differentiated user-friendly products. The onchip RGB PWM significantly reduces the Bill-of-Material (BOM) costs.

The audio performance is optimized with stereo high fidelity 24-bit DAC. All internal analog circuitry uses differential signaling to guard against noise coupling from interfering RF. The external BOM cost is minimized with internal PLL and headset in-rush circuit.

The CX2077x turnkey solutions eliminate the need for a multiple-chip reference design, making it easy and economical for manufacturers to design high-quality audio products. A complete evaluation kit with reference board and all the necessary technical documents and software is available.



Key Features

USB Audio Codec with integrated DSP

Tri-color PWM LED Driver

Advanced Voice and Audio DSP Algorithms

Dual Stereo DMA Endpoints

Digital Audio Interfaces

Benefits

Audio enhancement and optimization for speakers and microphones

Configurable features for product differentiation

Improves audio and voice experience

Independent Gaming audio and voice audio

Connect to third party digital audio processor

CX2077x Features

- On-Chip Voice//Audio DSP
 - DSP support for 3D, EQ, NR, AEC, BF,CNG, ST, AGC, and DRC
 - USB Codex, 2.0 Full Speed
- Stereo Input, Differential and Singleended
- Microphone Input
- Stereo Input, Single-ended for Line-in
- Stereo Output, Differential and Singleended
- Line Output
- Stereo Headphone Driver, Single-
- **HP Output**
- Dual Stereo DMA End Points
- PCM/I²S, S/PDIF Digital Audio I/F(s) UART, I²C
- Stereo DAC/Stereo ADC
- 8, 16, 24, 32, 44.1, 48 kHz Sampling
 - <100 mA operation for Headset/ Headphone Terminal Type

- Tri-color (RGB) PWM LED Driver and controller
- 8-bit 256-step independent and group brightness and dimming control
- 9kB Controller RAM for firmware extension and plug-in
- Up to 18 GPIO
- Volume, Mute, Hook, and LED
- Infinity rotary wheel control
- Press-N-Hold button support
- 4 wires external Co-processor interface (I²S/SPDIF-Out)
- In-rush Circuit Elimination Circuit for Headset/Headphone applications
- Stereo Microphone input with hardware boost and bias
- 35 mW Stereo Headphone driver
- Jack Sense
- Interface to controller LCD display
- 24-button keypad support
- 48-pin and 64-pin QFN Package

Applications

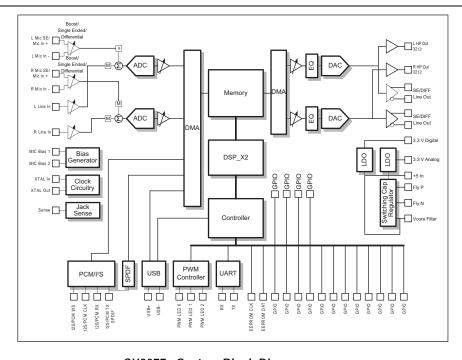
- Unified Communication USB Headset
- **Skype Super-wideband Headset**
- **Entertainment USB Headset/** Headphones
- **Gaming USB Headset**
- **USB Microphone**

Part Number CX2077x Description

USB Audio Codec IC with Integrated DSP and Tri-color PWM LED Driver

CX2077x Product Comparison

Feature	Part Number		
	CX20773	CX20774	CX20776
USB Audio	USB 2.0 Full Speed	USB 2.0 Full Speed	USB 2.0 Full Speed
Converter/Sampling Rate	2 DAC/ 2 ADC Supporting 8, 16, 24, 32, 44.1, 48 KHz	2 DAC/ 2 ADC Supporting 8. 16, 24, 32, 44.1, 48 KHz	2 DAC/ 2 ADC Supporting 8. 16, 24, 32, 44.1, 48 KHz
Tri-color PWM LED Driver	No	Yes	Yes
Microphone In	Stereo	Stereo	Differential Stereo
Headphone	Stereo	Stereo	Stereo
Differential Line Out	No	No	Yes
Text LCD Display Controller	No	No	Yes
Keypad/Buttons	8 Keys	8 Keys	24 Keys
Four Position Toggle Switch	Yes	Yes	Yes
1 ² S	Yes	Yes	Yes
SPDIF Out	Yes	Yes	Yes
DSP	Yes	Yes	Yes
Auxillary Input	Yes	Yes	Yes
Package	48 QFN	48 QFN	64 QFN



CX2077x System Block Diagram

Conexant Product Portfolio

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

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