

# CX20988 USB-C Compliant Crystal-less Audio CODEC

## Product Brief



# USB-C Compliant Audio CODEC

## Product Overview

The Conexant CX20988 is a highly-integrated, low-cost USB audio CODEC that is optimized for USB Type C headset applications. The device features 24-bit stereo playback and record paths for music and voice communication applications. Sampling rates up to 48kHz are supported on both paths. The CX20988 features a five-band parametric EQ for playback, a two-band EQ for recording, adjustable microphone boost in 3dB steps, stereo line input, and a stereo headphone driver.

The CX20988 has minimized the external BOM cost by removing the need for an external crystal, and also integrates a capless headphone driver that produces a full-range frequency response and eliminates AC coupling capacitors. The device integrates headset support with auto-detect and auto-switch between CTIA and OMTP-style headsets to eliminate all external BOM.

The CX20988 can be powered by either 3.3V or 5V. The integrated LDO regulators provide clean micbias sources that ensure maximum performance. All internal analog circuitry uses differential signaling to guard against noise coupling from the GSM and TDMA radio frequencies. Current limiting circuitry that allows compliance with the USB inrush current requirement is also integrated.

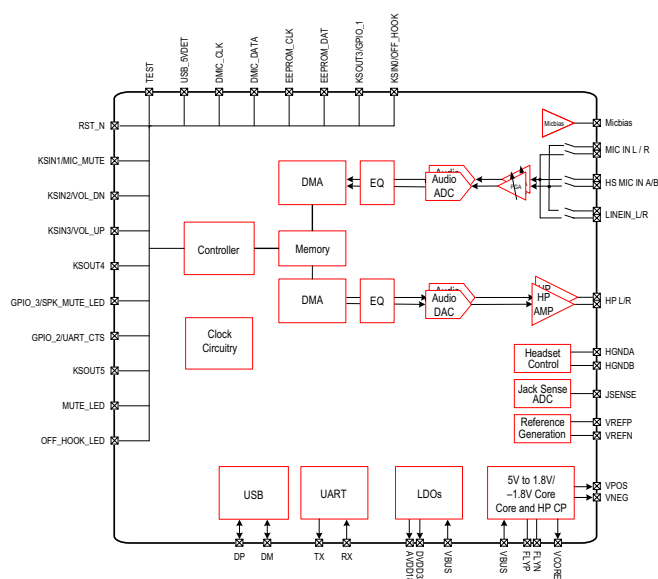
The CX20988 includes support for a PDM DMIC. A UART control interface is also available. A total of 11 GPIO pins are provided for peripheral connectivity. The CX20988 also includes an eight-button programmable keypad.

The CX20988 is fully compliant with industry specifications, including USB 2.0 WHCK 2.1, as well as enterprise requirements for Lync and Skype. The entire reference design requires a minimal PCB area, which is ideal for USB Type C headset designs. This solution is available in a 46-pin, 3.09mm x 3.09mm WLCSP package.

## Key Features

- **USB Type C compliant stereo audio CODEC**
- **USB 2.0 full-speed compliant**
- **Crystal-free solution**
- **Available in tiny WLCSP of a 3.09mm x 3.09mm package**
- 1.5mA USB suspend current
- Stereo record path supports either a single-ended microphone input or single-ended line input that supports 8kHz, 16kHz, 24kHz, 32kHz, 44.1kHz, and 48kHz sampling rates
- Stereo playback path with a capless headphone driver that eliminates the external BOM cost and PCB space of AC coupling capacitors, and supports 8kHz, 16kHz, 24kHz, 32kHz, 44.1kHz, and 48kHz sampling rates
- Built-in, four-conductor headset jack supports headphone/headset auto-detection, as well as auto switching between CTIA and OMTP-style headsets without any external components

## System Block Diagram



## Additional Features

- In-line, four-button support on the microphone path that meets the *Android Wired Audio Headset Specification*
- DRC on the playback path
- Five-band digital EQ for playback and recording
- Microphone boost settings of 0dB to 36dB, in 3dB steps
- Digital volume up/down control
- Mute buttons with LED for:
  - Microphone
  - Speaker
- 3.3V or 5V power
- UART
- 11.4mA typical current
- Eight-button keypad support
- Up to 11 GPIO pins
- 46-pin WLCSP package, 3.09mm x 3.09mm

## Electrical Characteristics

Parameter	Minimum	Nominal	Maximum	Standby	Unit	Comments
Input Voltage	2.7	-	5.25	-	V	-
Idle Current	-	11.4	-	-	mA	Input voltage = 5V.
Standby Current	-	1.5	-	-	mA	Input voltage = 5V.
Temperature	-40	27	85		°C	Operating temperature.

## Ordering Information

Part Number	Package	Description
CX20988-10Z	46-Pin WLCSP	USB-C Compliant Crystal-less Audio CODEC.

**Note:** All devices are lead-free (Pb-free) and RoHS-compliant.

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