

# CA20K2 Audio Processor

## Overview

The CA20K2 digital audio processor is based on the CA20K1 architecture. The CA20K2 uses an advanced PCI Express (PCIe) one-lane interface and adds an embedded RISC processor to safeguard against long control latencies introduced by the PCIe interface. The CA20K2 also expands the audio I/O capabilities and adds DDRAM for increased local memory bandwidth. In addition, the CA20K2 incorporates a Universal Audio Architecture (UAA) component and is available in 0.13µm BGA package size 19mm by 19mm.

The X-Fi audio enhancement algorithm is integrated into the CA20K2 audio processor to extend the X-Fi enjoyment to the customers. As the next generation high-resolution audio processor, CA20K2 provides dramatic improvements to enhance listening experiences for movies and improves the capabilities, performance and quality of audio. The enhanced sound quality makes movies more realistic. Users can truly immerse themselves in scenes like underwater, volcano eruption, war zone etc. while enjoying the enhanced sound effect at home. The X-Fi module gives you an experience beyond studio quality. Users can enjoy the live concert experience in their own comfortable surroundings.

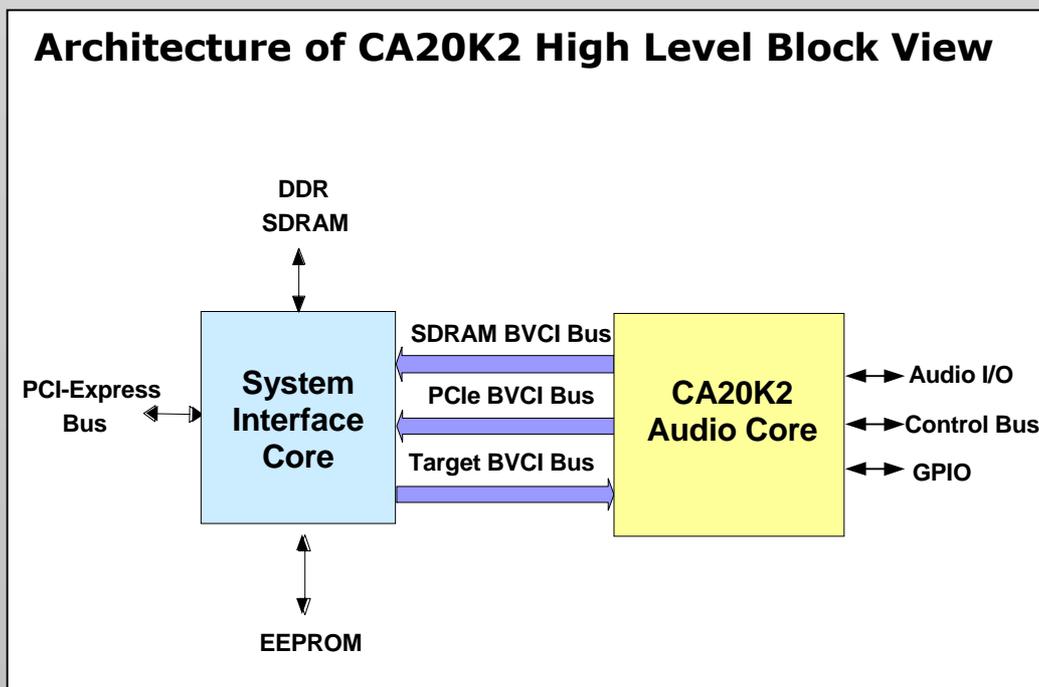
## Applications

- ❑ **Gaming Soundcard**
- ❑ **Entertainment PC**
- ❑ **Desktop PC Motherboards**
- ❑ **Audio Creation**
- ❑ **General Purpose multi-channel I/O**

## Key Features

- ❑ **X-Fi CMSS-3D**
- ❑ **X-Fi Crystalizer™**
- ❑ **EAX® Advanced HD 5.0 for games**
- ❑ **10 Band Multi-channel Equalizer**
- ❑ **PCI Express 1.1 interface**
- ❑ **UAA**
- ❑ **THX Certification**
- ❑ **Smart Volume Management**
- ❑ **OpenAL Support**
- ❑ **Creative ALchemy**
- ❑ **Vista Premium Logo**

## Architecture of CA20K2 High Level Block View





## Key Features

- PCI Express 1.1 interface, up to 8 simultaneous transactions supported
- Sample Rate Converter engine
- Digital Filter engine
- Tank, digital delay line accelerator
- Audio Mixer
- Microprogramable "Quartet" audio DSP
- 4 stereo S/PDIF inputs and 4 stereo S/PDIF outputs
- 4 stereo I2S digital inputs and 4 stereo I2S digital outputs
- Sample rate slave capability to I2S and S/PDIF
- DDR SDRAM interface
- Parameter Generator / Mixer
- Universal Audio Architecture component
- Integrated HD-Audio core with core switch
- Up to 32 GPIOs
- 16-bit general purpose parallel control bus
- I2C master interface

## Audio Enhancement

- **X-Fi audio enhancement algorithm**
  - **X-Fi CMSS-3D Surround**
    - Stereo Xpand for stereo to multi-channel upmix with ambient extraction and voice centering.
    - Stereo Surround for duplicating of stereo over multi-channel.
  - **X-Fi CMSS-3D Headphone Expander** for externalization of stereo content and very accurate HRTF for 3D positioning.
  - **X-Fi CMSS-3D Virtual** for audio virtualization and enhancements over 2 loudspeakers. Stereo Surround mode
  - **X-Fi Crystalizer™**
    - Enhances musical dynamics by emphasizing sharp percussive sounds and transients.
    - Creating a "puncher" and more dynamic listening experience.
- **THX Setup Console and THX Certification**
- **Highest Quality Audio**
  - 24-bit/96kHz recording
  - 24-bit/96kHz 7.1 playback, 24-bit/192kHz Stereo playback
- **10-Band, Multi-Channel Graphics Equalizer support presets and custom preset**
- **SVM – Smart Volume Management**
- **EAX® ADVANCED HD™ 5.0**
  - **128 Voices**
  - **EAX® Voice**
  - **EAX® PurePath™**
  - **Environment FlexiFX**
  - **EAX® MacroFX™**
  - **Environment Occlusion™**
- **OpenAL Support**
- **Creative ALchemy**  
Provides multi-channel audio for legacy game titles running on Windows Vista™

**International inquiries:**  
**Creative Technology Ltd.**  
 31, International Business Park  
 Creative Resource  
 Singapore 609921  
 Tel: +65 895 4000  
 Fax: +65 895 4050

**Americas inquiries:**  
**Creative Labs, Inc.**  
 1901 McCarthy Boulevard  
 Milpitas, CA 95035  
 Tel: +1 (408) 428 6600  
 Fax: +1 (408) 428 2394

### DISCLAIMER

Products furnished by Creative are believed to be accurate and reliable. However, Creative reserves the right to make changes in its sole discretion, at any time to the products. CREATIVE DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES FOR THE PRODUCTS PROVIDED HEREUNDER, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, NOR DOES IT MAKE ANY WARRANTY FOR ANY INFRINGEMENT OF PATENTS OR OTHER RIGHTS OF THIRD PARTIES WHICH MAY RESULT FROM THE PRODUCTS. Creative assumes no obligation to correct any errors contained in the products provided hereunder or to advise users of the products of any correction if such be made. Customers are advised to obtain the latest version of product specification, and Creative makes no assurance that Creative's products are appropriate for any application by any particular customer. Creative products are not intended for use in life support appliances, devices, or systems.