

## 1. Introduction

CA0112 “Golden Gate” chip is a PCI audio chip that is fully compliant UAA specification. The main purpose of “Golden Gate” is to be a companion chip for 20k1 to develop UAA compliant Xi-FI audio products.

## 2. Feature

### PCI core

- PCI specification 2.3 compliant. Universal Audio Architecture (UAA) v1.0 compliance.
- Supports 32bits PCI addressing.
- Creative propriety mode to switch between UAA and X-FI mode.

### UAA audio hardware core

- Supports 3 independent DMA playback stream:
  - 4x stereo analog output hardware output channels.
  - 1x stereo headphone hardware output channel.
  - 1x stereo digital hardware output channel.
  - I2C EERPOM support to
    - 1) Re-configure the number of analog output exposed to OS.
    - 2) Disable headphone and digital output channels.
- Supports 5 independent DMA record stream:
  - 1x stereo Line In
  - 2x stereo MIC In (Front/read)
  - 1x auxiliary IN
  - 1x stereo SPDIF input.
  - I2C EERPOM support to disable line in, MIC in or auxiliary in or SPDIF input.
- Supports Microsoft ‘out-of-the-box’ HDA driver
- Audio outputs
  - All playback channels support 16 and 24 bit stereo format.
  - I2S Output supports sampling rate of 44.1 KHz, 48 KHz, 96 KHz and 192 KHz.
  - SPDIF digital output supports sample rate of 44.1 KHz, 48 KHz and 96 KHz.
  - Each playback DMA stream’s sample rate and bit format are independent.
  - SPDIF Output will play Non-PCM data when digital stream is enabled.
- Audio inputs
  - All recording channels support 16 and 24 bit stereo format.
  - Line In and MIC In support sampling rate of 48 KHz, 96 KHz and 192 KHz.
  - SPDIF input supports sampling rate of 44.1 KHz, 48 KHz and 96 KHz.
  - Each record DMA stream’s sample rate and bit format are independent.
- 1x I2C interface with configurable via I2C EEPROM to control on-board DAC/ADC.
- 2 GPOs to control on-board anti-pop circuit and muting of headphone and speaker output.
- 11 GPI input for audio jack detection.

### 20k1 mode

- 1x SPDIF input to I2S output format converter of 24-bit with sample rate 48 KHz, 96 KHz and 192 KHz.
- 3x I2S input to SPDIF output format converter of 24-bit with sample rate of 44.1 KHz, 48 KHz, 96 KHz and 192 KHz.

### 3. Chip architecture

Figure 3-1 below shows the CA0112 “Golden Gate” chip architecture.

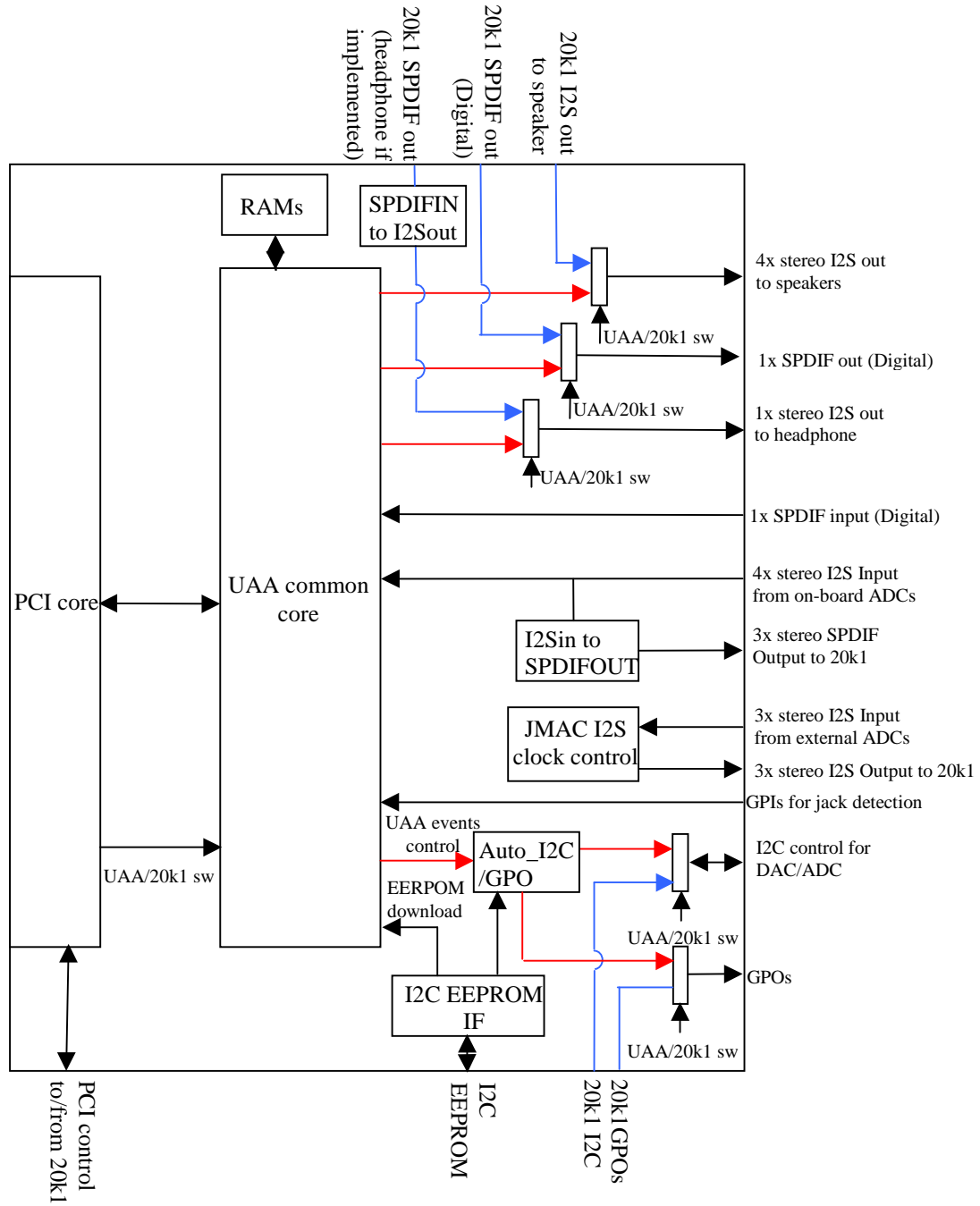


Figure 3-1 CA0112 “Golden Gate” chip architecture

## 4. PCI Configuration Space

### Overview

The UAA-20K1 dual-chip (CA0112 “Golden Gate” chip) solution is similar in spirit to Hybrid VGA and 3D Graphics solutions. In the power-on condition, the dual-chip solution is in UAA mode as default. Upon Creative Driver startup or initialization, the software driver will switch the dual-chip solution to X-Fi mode. Upon Creative Driver shutdown or uninstall, the Driver will switch the dual-chip back to UAA mode. The switch from UAA mode to 20K1 mode, and vice-versa, does not result in a change to PCI configuration, as the OS would see it.

## 5 Physical Connection

