

1. General Description

The ALC888S-VC and ALC888SDD-VC are high-performance 7.1+2 Channel High Definition Audio Codecs with two independent S/PDIF outputs. They feature ten DAC channels that simultaneously support 7.1 sound playback, plus independent stereo sound output (multiple streaming) through the front panel stereo outputs, and integrate two stereo ADCs that can support a stereo microphone, and feature Acoustic Echo Cancellation (AEC), Beam Forming (BF), and Noise Suppression (NS) for voice applications.

The ALC888S-VC supports 16/20/24-bit S/DPIF input and output functions with sampling rate of up to 192kHz, offering easy connection of PCs to high quality consumer electronic products such as digital decoders and Minidisk devices. In addition to the standard (primary) S/PDIF output function, ALC888S features another independent (secondary) S/PDIF-OUT output and converters that transport digital audio output to a High Definition Media Interface (HDMI) transmitter (becoming more common in high-end PCs).

All analog IO are input and output capable, and headphone amplifiers are also integrated at each analog output. All analog IOs can be re-tasked according to user's definitions, or automatically switched

The ALC888S-VC series support host audio controller from the Intel ICH series chipset, and also from any other HDA compatible audio controller. With EAX/Direct Sound 3D/I3DL2/A3D compatibility, and excellent software utilities like environment sound emulation, multiple-band software equalizer and dynamic range control, optional Dolby® Digital Live, DTS® CONNECT™, and Dolby® Home Theater programs, the ALC888S provides an excellent home entertainment package and game experience for PC users.

The ALC888S-VC is an upgraded version of the ALC888S version B that meets the current WLP3.10 (Windows Logo Program) and future WLP requirements that become effective from 01 June 2008 (See section 2.3 Enhanced Features, page 4). The ALC888S-VC also conforms to Intel's Audio Codec low power state white paper and is ECR compliant.

2. Features

2.1. Hardware Features

- Meets premium audio requirements for Microsoft WLP 3.10
- Meets stricter performance requirements for future WLP effective from 01 June 2008
- High-performance DACs with 97dB SNR (A-Weighting), ADCs with 90dB SNR (A-Weighting)
- Ten DAC channels support 16/20/24-bit PCM format for 7.1 sound playback, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel output
- Two stereo ADCs support 16/20/24-bit PCM format recording simultaneously
- All DACs supports 16/20/24-bit, 44.1k/48k/96k/192kHz sample rate
- All ADCs supports 16/20/24-bit, 44.1k/48k/96k/192kHz sample rate
- Two independent S/PDIF-OUT converters support 16/20/24-bit, 44.1k/48k/88.2k/96k/192kHz sample rate. One converter for normal S/PDIF output, the other outputs an independent digital stream to the HDMI transmitter
- One S/PDIF-IN converter supports 44.1k/48k/96k/192k Hz sample rate
- High-quality analog differential CD input
- Supports external PCBEEP input, built-in digital BEEP generator, and pass through function in D3 mode
- Software selectable 2.5V/3.75V/4.7V VREFOUT
- Two jack detection pins each designed to detect up to 4 jacks
- Extra jack detection pin for CD input when it is used as an optional line level input, S/PDIF input and output
- Supports legacy analog mixer architecture
- Wide range (-80dB ~ +42dB) volume control with 1.5dB resolution of analog to analog mixer gain
- Software selectable boost gain (+10/+20/+30dB) for analog microphone input
- All analog jacks are stereo input and output re-tasking for analog plug & play
- Built-in headphone amplifiers for each re-tasking jack
- Two GPIOs for customized applications
- Supports Anti-pop mode when analog power AVDD is on and digital power is off

- Support stereo digital microphone interface to improve voice quality
- Integrates high pass filter to cancel DC offset generated from digital microphone
- 48-pin LQFP 'Green' package
- Support low voltage IO for HDA Link (1.5V~3.3V)
- Intel low power ECR compliant, supports power status control for each analog converter and pin widgets, supports jack detection and wake up event in D3 mode

2.2. Software Features

- Meets Microsoft WLP 3.10 and future WLP audio requirements
- WaveRT based audio function driver for Windows Vista
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- Emulation of 26 sound environments to enhance gaming experience
- Multi bands of software equalizer and tool are provided
- Voice Cancellation and Key Shifting effect
- Dynamic range control (expander, compressor and limiter) with adjustable parameters
- Intuitive Configuration Panel (Realtek Audio Manager) to enhance user experience
- Provides 10-foot GUI for Windows Media Center
- Microphone Acoustic Echo Cancellation (AEC), Noise Suppression (NS), and Beam Forming (BF) technology for voice application
- Smart multiple streaming operation
- HDMI audio driver for AMD platform
- Dolby® PCEE program™ (optional software feature)
- DTS® CONNECT™ (optional software feature)

- SRS® TrueSurround HD (optional software feature)
- Fortemedia® SAM™ technology for voice processing (Beam Forming and Acoustic Echo Cancellation) (optional software feature)
- Creative® Host Audio program (optional software feature)
- Voice recognition and Realtek proprietary API (SkyTel) is supported (optional software feature)

2.3. Enhanced Features

- Meet performance requirements in future WLP version (Effective from 01 June 2008)
- ADC supports 24-bit PCM format and 192kHz sample rate recording
- Supports secondary S/PDIF-OUT converter to output digital audio to external HDMI transmitter
- PCBEEP pass through function is supported when Codec is in D3 power down mode
- 3rd jack detection pin for CD input, S/PDIF output, and S/PDIF input connector
- Integrated high-pass filter to cancel DC offset generated from a digital microphone
- Intel low power ECR compliant, supports power status control for each analog converter and pin widget, supports jack detection and wake-up event in D3 mode

3. System Applications

- Desktop multimedia PCs
- Notebook PCs
- Information appliances (IA) e.g., set-top box

4. Block Diagram

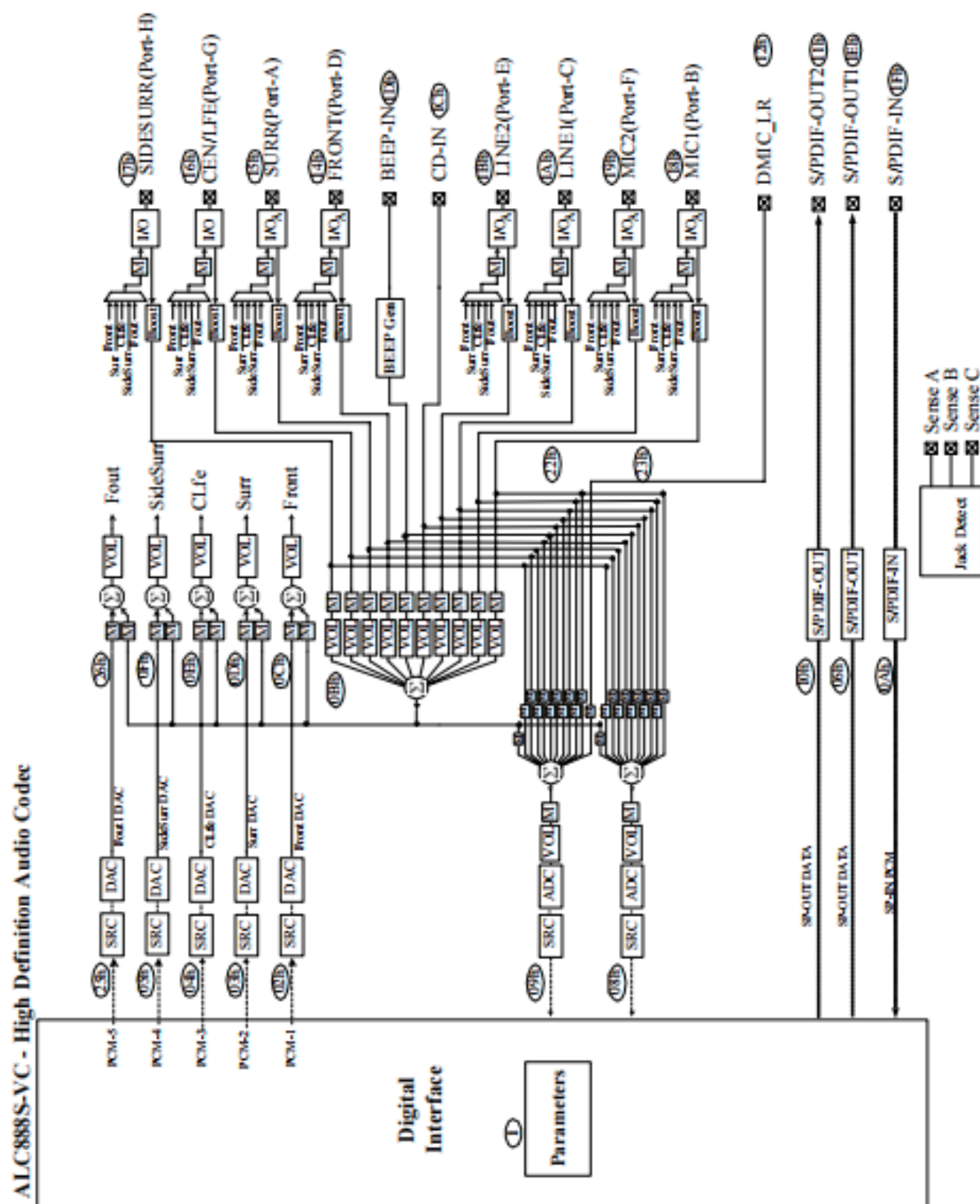


Figure 1. Block Diagram

4.1. Analog Input/Output Unit

Pin Complex widgets NID=14h~1Bh are re-tasking IO.

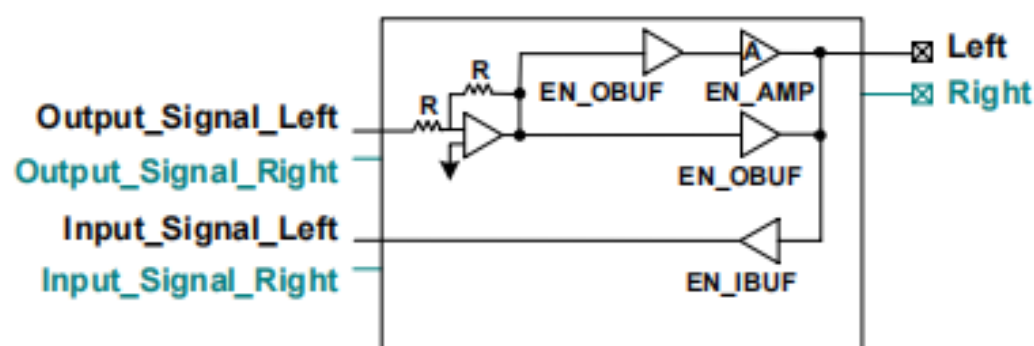


Figure 2. Analog Input/Output Unit