Product Brief

AS3517

Stereo Audio Codec with advanced System Power Management

General Description

The AS3517 is a low power stereo audio codec and is designed for Portable Digital Audio Applications. It allows playback and recording in CD quality. It has a variety of audio inputs and outputs to directly connect electret microphones, 16Ω headset and auxiliary signal sources via a 10-channel mixer. It only consumes 20mW in playback mode.

Further the device offers advanced power management functions. All necessary ICs and peripherals in a Digital Audio Player with flash or harddisk memory are supplied by the AS3517. The power management block generates 11 different supply voltages out of the battery supply. CPU, NAND flash, SRAM, memory cards, harddisk, LCD backlight, USB-HOST and USB-OTG can be powered. The different supply voltages are programmable via the serial control interface. AS3517 also contains a charger. The supply voltage can range from 3.0V to 5.5V.

The AS3517 has an on-chip, phase locked loop (PLL) controlled, clock generator. It generates 44.1kHz, 48kHz and other sample rates defined in MP3, AAC, WMA, OGG VORBIS etc. No additional external crystal or PLL is needed in slave mode. Further the AS3517 has an independent 32kHz real time clock (RTC) on chip which allows a complete power down of the system CPU.

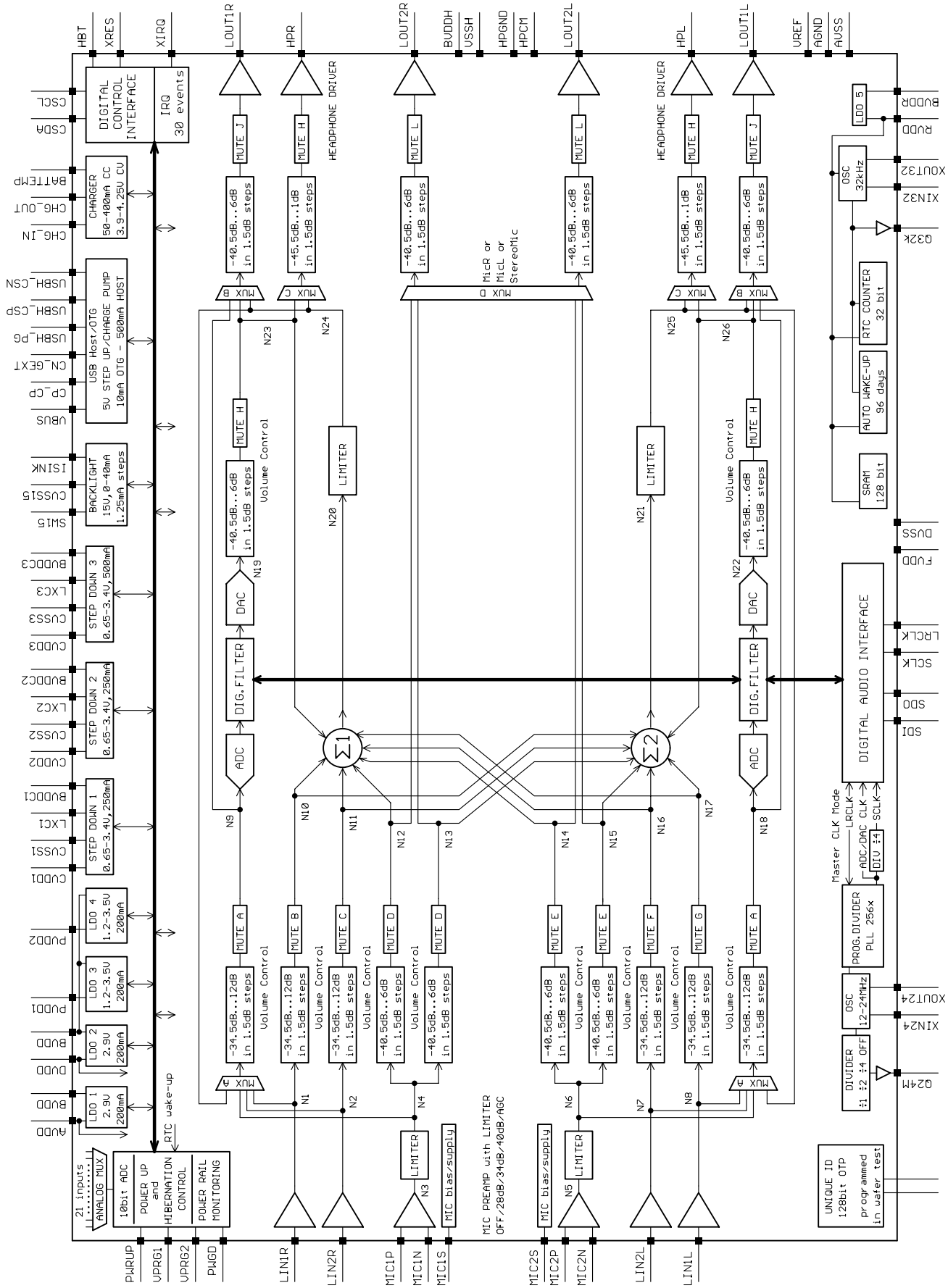
Key Features

- Multi-bit Sigma Delta Converters
  - DAC: 18bit with 94dB SNR ('A' weighted)
  - ADC: 20bit with 94dB SNR ('A' weighted)
  - Sampling Frequency: 8-48kHz
- 2 Microphone Inputs
  - 3 gain pre-setting (28dB/34dB/40dB) and OFF
  - 32 gain steps @1.5dB and MUTE
  - supply for electret microphones
  - microphone detection
  - voice activation
  - remote control by switch
- 2 Line Inputs
  - volume control via serial interface
  - 32 steps @1.5dB and MUTE
  - stereo or 2x mono or mono differential
- 2 Line Outputs
  - volume control via serial interface
  - 32 steps @1.5dB and MUTE
  - 1Vp @10kΩ
- High Efficiency Headphone Amplifier
  - volume control via serial interface
  - 32 steps @1.5dB and MUTE
  - 2x60mW @16Ω driver capability
  - headphone and over-current detection
  - phantom ground eliminates large capacitors
- Audio Mixer
  - 10 channel input/output mixer
  - mixes line inputs and microphones with DAC
  - left and right channels independent
- Power Management
  - step down for harddisk (0.65V-3.4V, 500mA)
  - step down for CPUcore (0.65V-3.4V, 250mA)
  - step down for peripheral (0.65V-3.4V, 250mA)
  - charge pump for USB OTG (5V, 10mA)
  - step up for USB HOST/OTG (5V, 500mA)
  - step up for backlight (15V, 40mA), dimming
  - LDO for digital supply (2.9V, 200mA)
  - LDO for analogue supply (2.9V, 200mA)
  - LDO for peripherals (1.2V-3.5V, 200mA)
  - LDO for peripherals (1.2V-3.5V, 200mA)
  - LDO for RTC (1.0V-2.5V, 2mA)
  - power supply supervision
  - hibernation modes
  - 10sec and 5sec emergency shut-down
- Battery Charger
  - automatic trickle charge (50mA)
  - prog. constant current charging (50-400mA)
  - prog. constant voltage charging (3.9V-4.25V)
- Real Time Clock
  - ultra low power 32kHz oscillator
  - 32bit RTC sec counter, 96 days auto wake-up
  - selectable alarm (seconds or minutes)
  - 128bit free SRAM for random settings
  - 32kHz clock output to peripheral
- Auxiliary Oscillator (only for master clock mode)
  - low power 12-24MHz oscillator
  - master clock output to peripheral (e.g.CPU)
- General Purpose ADC
  - 10bit resolution
  - 21 inputs analogue multiplexer
- Interfaces
  - I²S digital audio interface and SPDIF
  - 2 wire serial control interface
  - reset pin, watchdog via serial interface and pin
  - power good pin, PWM output
  - 128bit unique ID (OTP)
  - 30 different interrupts
- Package BGA81 [9.0x9.0x1.15mm] 0.8mm pitch

Application

Portable Digital Audio Player and Recorder
PDA, Smartphone

Block Diagram



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Contact Information

Headquarters:

austriamicrosystems AG
Business Unit Communications
A 8141 Schloss Premstätten, Austria
T. +43 (0) 3136 500 0
F. +43 (0) 3136 5692
info@austriamicrosystems.com

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