AS3518

Stereo Audio Codec with enhanced System Power Management

1 General Description

The AS3518 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/32Ω headsets and auxiliary signal sources via a 10-channel mixer. It consumes less than 20mW in playback mode.

Further the device offers advanced power management functions. All necessary ICs and peripherals in a Digital Audio Player are supplied by the AS3518. The different regulated supply voltages are programmable via the serial control interface. AS3518 also contains a Li-Io battery charger. The single supply voltage may vary from 1.0V to 5.5V.

The AS3518 has an on-chip, phase locked loop (PLL) which generates the needed internal CODEC master clock. I2S Frame and shift-clock has to be applied from the processor for playback and recording. Further the AS3518 has an independent 32kHz real time clock (RTC) on chip which allows a complete power down of the system CPU.

2 Key Features

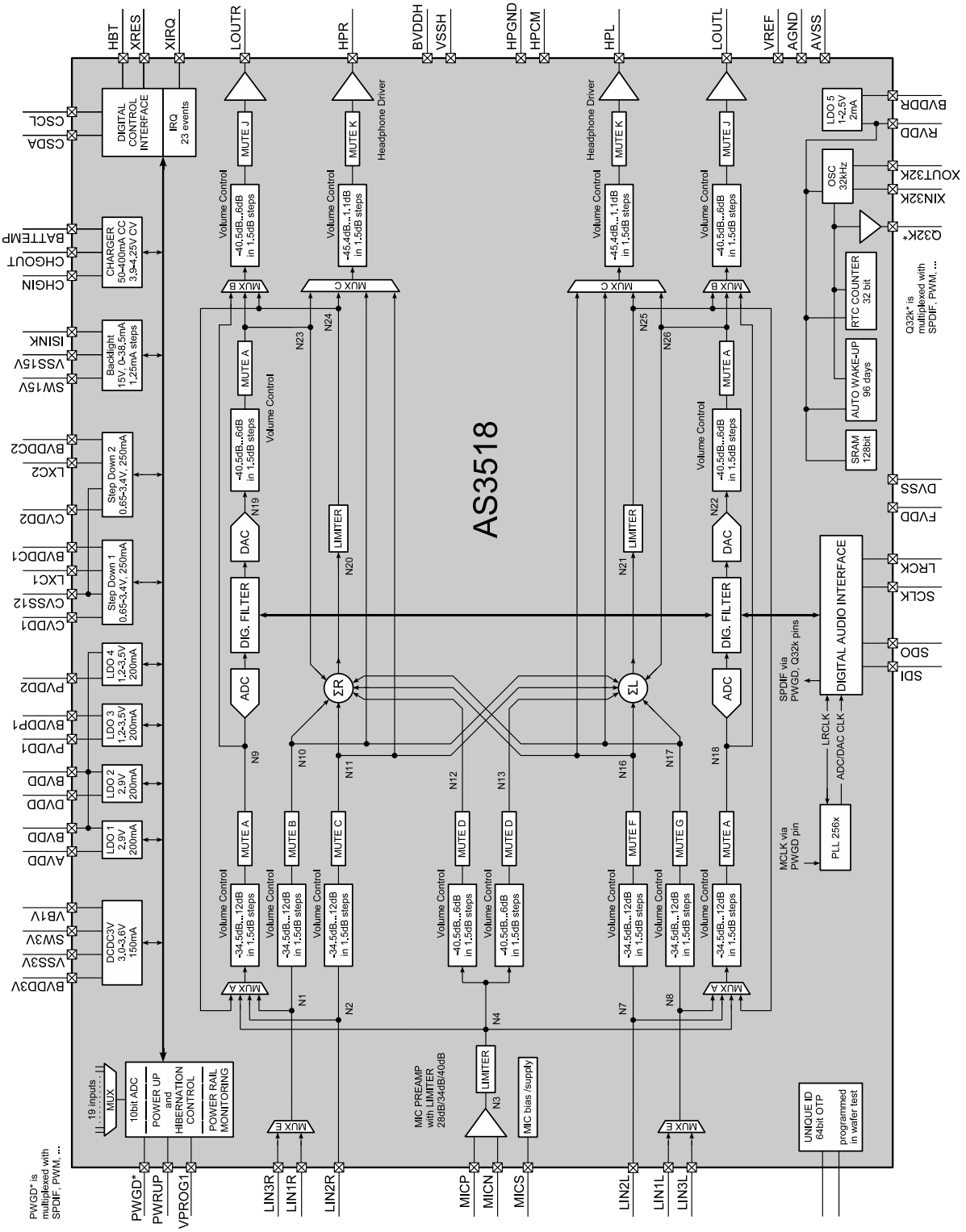
- Multi-bit Sigma Delta Converters
  - DAC: 18bit with 94dB SNR ('A' weighted)
  - ADC: 20bit with 90dB SNR ('A' weighted)
  - Sampling Frequency: 8-48kHz
- 1 Microphone Input
  - 3 gain pre-setting (28dB/34dB/40dB) and AGC
  - 32 gain steps @1.5dB and MUTE
  - supply for electret microphone
  - microphone detection
  - remote control by switch
- 3 Line Inputs
  - volume control via serial interface
  - 32 steps @1.5dB and MUTE
  - stereo or 2x mono or mono differential
- Audio Mixer
  - 8 channel input/output mixer with AGC
  - mixes line inputs and microphones with DAC
  - left and right channels independent
- Line Output
  - volume control via serial interface
  - 32 steps @1.5dB and MUTE
  - 1Vp @10kΩ
  - Stereo 2*5mW @16Ω
  - Mono differential 10mW @32Ω (earpiece)
- 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
- Power Management
  - step down for CPU core (0.65V-3.4V, 250mA)
  - step down for peripheral (0.65V-3.4V, 250mA)
  - step up for backlight (15V (25V), 38mA), dimming, voltage control mode
  - LDO for AFE analog supply (2.9V, 200mA)
  - LDO for AFE digital supply (2.9V, 200mA)
  - LDO for peripherals (1.2V-3.5V, 200mA)
  - LDO for peripherals e.g. USB (1.2V-3.5V, 200mA)
  - power supply supervision
  - hibernation modes
  - 5sec and 10sec emergency shut-down
- Battery Charger
  - automatic trickle charge (50mA)
  - prog. constant current charging (50-460mA)
  - prog. constant voltage charging (3.9V-4.25V)
  - current limitation for USB mode
- 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
  - voltage generation
  - <1uA total power consumption
- General Purpose ADC
  - 10bit resolution
  - 21 inputs analog multiplexer
- Interfaces
  - I²S digital audio interface and SPDIF
  - 2 wire serial control interface
  - reset pin, watchdog, power good pin
  - PWM output
  - 64bit unique ID (OTP)
  - 23 different interrupts
- Package CTBGA64 [7.0x7.0x1.1mm] 0.8mm pitch

3 Application

Portable Digital Audio Player and Recorder
PDA, Smartphone

4 Block Diagram

Figure 1 AS3518 Block Diagram



5 Copyright

6 Disclaimer

Devices sold by austriamicrosystems AG are covered by the warranty and patent identification provisions appearing in its Term of Sale. austriamicrosystems AG makes no warranty, express, statutory, implied, or by description regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. austriamicrosystems AG reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with austriamicrosystems AG for current information. This product is intended for use in normal commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by austriamicrosystems AG for each application.

The information furnished here by austriamicrosystems AG is believed to be correct and accurate. However, austriamicrosystems AG shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of austriamicrosystems AG rendering of technical or other services.

7 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

For Sales Offices, Distributors and Representatives, please visit:

www.austriamicrosystems.com

austriamicrosystems – a leap ahead