Advanced Audio Decoder
AS3521B

PRODUCT BRIEF

1. General Description

The chip is a fully integrated and highly flexible digital audio decoder for the austriamicrosystems mobile music platform. Main purpose of this platform is the integration of digital audio decoder (MP3, AAC and other formats as future option), micro controller unit, data interfaces and the analog audio channels for reproduction of digital audio.

This codec-chip contains a high performance 18 bit digital to analog converter. The dynamic range exceeds 95dB for best audio quality, for multi media applications (audio playback) within battery or line operated equipment.

An additional audio power amplifier can directly drive external headphones or small 4Ω speakers with a power of up to half a watt. The power-up is click- and pop-less due to a smooth start-up circuitry. The overall distortion level is always below 0.02%.

The microphone input amplifier contains an automatic gain control (AGC) with a dynamic range of 40dB to generate an amplified and compressed signal for the ADC, which provides 14 Bit resolution at 8kHz sampling-rate.

Furthermore all necessary power management is included such as bandgap reference and three voltage regulators. The two 2.9V regulators are used internally (analog and digital supply), but can also be used for external purposes as well. The third output is designed to supply the digital core, and is programmable to either 2.25V or 2.5V. The performance of the regulators is excellent (noise, line- and load-regulation) and allows the direct supply of sensitive analog circuits.

Because of the internal supply and signal filtering only few small external capacitors are required for de-coupling and stabilising and lead to very low output noise.

The current consumption is very low and makes the chip ideally for battery powered devices.

2. Key Features

Embedded 32-Bit RISC Controller

- MCU and DSP functionality
- Scaleable architecture
- User accessible controller/DSP/memory resources
- Boot ROM
- Clock speed: 16 - 65 MHz

Hardware Interfaces

- USB Interface version 1.1 (support of MSC)
- MultiMediaCard / Secure Digital Card Interface (support of MMC mode)
- Smart Media Card Interface
- NAND Flash Interface
- I^2C Slave Interface (for access to control registers)
- SPI (master or slave)
- General Purpose I/O Lines (40)

On chip DCDC Converter

- 1.0 to 5.5V input voltage range

4 On-chip high performance voltage regulators

- Digital Supply, 2.9V
- Analog Supply, 2,9V
- Core Supply, 2.25V
- USB Transceiver Supply, 3.2V

18 Bit stereo DAC

- Dynamic range typ. 93 dB
- THD typ. -85dB
- De-emphasis for 32 kHz, 44.1 kHz and 48 kHz

Stereo power audio amplifier

- Max. 2x 0.5W @ 4Ω
- Analog volume control –39dB to +3dB, 3dB steps including mute)
- Click- and pop-less startup and power down
- Auxiliary inputs for additional audio sources

Microphone input

- 14 Bit ΣΔ–ADC mono
- 24kHz FM-quality recording
- Automatic gain control (AGC)

- Audio Formats: general platform for popular digital audio formats: MP3, AAC, WMA and others.
- Audio sampling rates: 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, and 48 kHz
- Wide battery supply range 1.0V – 5.5V
- 12.288MHz crystal or 13MHz clock input
- System Power Management Features
- Low power consumption

3. Applications

- Audio platform for cellular phones
- Stand alone MP3 player and PDAs
- CD and DVD player

4. Block Diagram

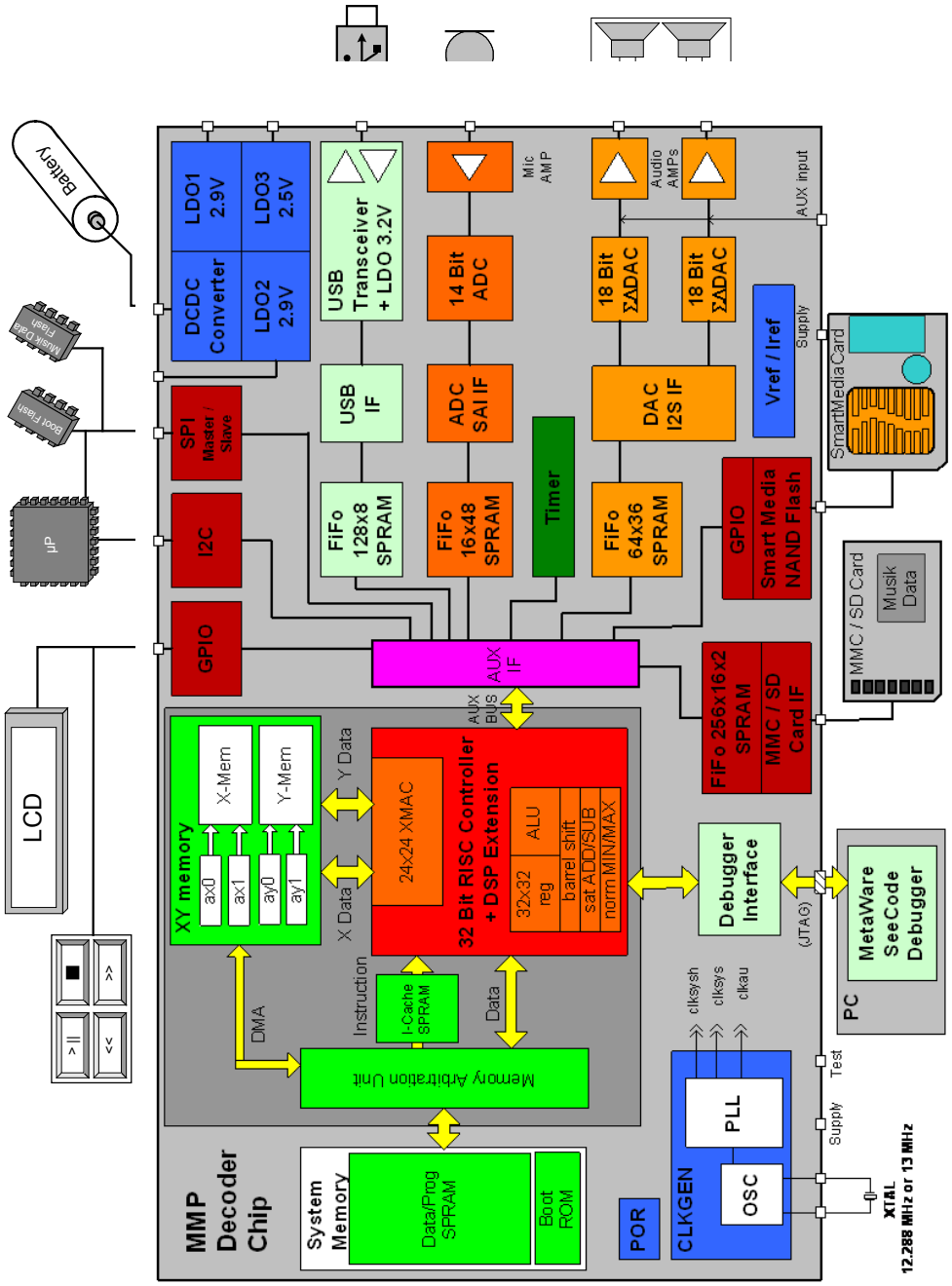

Figure 1 Block Diagram of AS3521

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