

# AS3524

## Advanced Audio Processor System

### 1 Description

The AS3524 implements a highly flexible and fully integrated digital audio processor system combining strong calculating power and high performance interfaces commonly used within audio player systems.

Using advanced 0.13µm process technology and large on chip RAM leads to outstanding low power consumption of 0.3 mW/MHz for the ARM922T microcontroller core and 0.6 mW/MHz for the overall system measured with a typical MP3 player SW application.

Based on a powerful ARM9TDMI capable of performing up to 200MIPS it is suited to run MP3, AAC, WMA, OGG... decoders and encoders and, in addition, it can perform extensive user interfaces, motion graphics support, video playback and much more.

The AS3524 SOC (system-on-a-Chip) features dedicated high speed interfaces for ATA IDE, USB2.0 HS-OTG and SDRAM ensuring maximum performance for download, upload, and playback.

Furthermore interfaces for NAND flashes, MMC/SD cards and Memory Stick ensure most flexible system design possibilities. Hardware support for parallel interfaces lower the CPU load serving complex and/or colour user interfaces.

Additional serial high-speed data and control interfaces guarantee the connection to other peripherals and or processors in the system.

Two independently programmable PLLs generate the required frequencies for audio playback/recording, for the processor core and for the USB interface at the same time.

### 2 Key Features

#### 2.1 Digital Core

##### Embedded 32-Bit RISC Controller



- ARM922TDMI RISC CPU
- 2.5Mbit on-chip RAM
- 1Mbit on chip ROM
- Clock speed max. 250MHz (200MIPS)
- Standard JTAG interface

##### USB 2.0 HS & OTG Interface

- Up to 480Mbit/s transfer speed
- USB 2.0 HS/FS physical including OTG support
- USB 2.0 HS/FS digital core including OTG host
- Dedicated dual port buffer RAM
- DMA bus master functionality

##### IDE Host Controller

- Supporting Ultra ATA 33/66/100/133 modes
- Programmable IO and Multi-word DMA capability
- Dedicated dual port buffer RAM
- DMA bus master functionality

##### External Memory Controller

- Dynamic memory interface
- Asynchronous static memory
- DMA bus master functionality

##### DMA Controller

- Single Master DMA controller
- 2 DMA channels possible at the same time
- 16 DMA requests supported

##### Interrupt Controller

- Support for 32 standard interrupts
- Support for 16 vectored IRQ interrupts

##### Audio Subsystem Interface

- Dedicated 2 wire serial control master
- I2S input and output with dual port buffer RAM

##### Nand Flash Interface

- 8 and 16bit flash support
- 3, 4 & 5 byte address support
- hardware ECC

##### MMC/SD Interface

- MMC/SD Card host for multiple card support
- 4 data line support for SD cards

MS / MS Pro Interface

- Dedicated dual port buffer RAM

Display Interface

- Serial and parallel controller supported
- On chip hardware acceleration

Synchronous Serial Interface

- Master and slave operation
- 8 and 16 bit support
- Several protocol standards supported

I2S Interface

- Input multiplexed with audio subsystem
- selectable SPDIF input conversion
- Dedicated dual port buffer RAM

2 Wire Serial Control Interface

- Master and slave operation
- Standard and fast mode support

General Purpose IO Interface

- 4x 8-bit ports

### 3 Application

- Portable Digital Audio Player and Recorder
- Portable Digital Media Player
- PDA
- Smartphone

## 4 Block Diagram

Figure 1 AS3524 Block Diagram

