

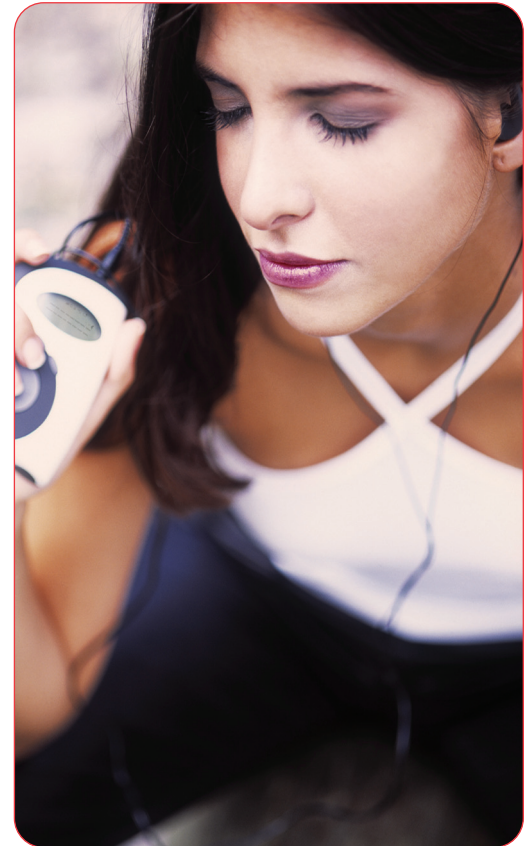
# MP3 FLASH PLAYER SOLUTION

## APPLICATION BRIEF

SigmaTel, as the worldwide market leader for portable digital audio technologies, enables companies to bring to market unique flash based MP3 players through patented semiconductor and software solutions. SigmaTel's integration and support allows customers to develop devices with the longest battery life, smallest form factors, fastest time-to-market, and lowest system design costs in the market.

SigmaTel provides OEMs and ODMs with the industry's most highly integrated solutions that integrate all of the essential elements for MP3 flash based players: Full Speed and High Speed USB, flash interface, system level DC-DC converter, battery charge circuitry, DAC and headphone amp, ADC for voice record and MP3 encode, LED and LCD interface, and an FM Tuner interface and control. With an integrated firmware controlled DC-DC converter, SigmaTel's audio decoder solutions are optimized for lower power consumption. In addition, SigmaTel-based MP3 flash players can power from USB, when connected to a PC, providing additional battery conservation.

Besides offering an integrated single-chip solution, SigmaTel provides the industry's most complete software development kit (SDK). Features supported in the SDK include: audio codecs, file system management, user interface, host applications, and digital rights management. With support for MP3 and WMA decode and MP3 encode, JPEG, and multiple Digital Rights Management protocols such as Portable Device Digital Rights Management (PDDRM) and Windows Media® Digital Rights Management 10 (WMDRM 10), customers can develop a broad range of feature rich solutions addressing a variety of different market needs.



### FEATURES FOR:

### **STMP3502, 3503, 3505, 3506, 3510, 3520, 3550, 3560**

- MP3 and WMA Decode
  - Field upgradeable to other digital music formats
- Digital Rights Management (DRM)
  - Portable Device Digital Rights Management (PDDRM)
  - Windows Media Digital Rights Management 10 (WMDRM 10)
- MP3 Encode
  - Voice, FM, or Line-in recording
- Voice record in ADPCM format
- On-chip read-only unique ID for Digital Rights Management (DRM)
- Flexible Memory Interface
  - SLC or MLC NAND Flash
  - SmartMedia
  - MMC
  - Secure Digital
  - CompactFlash
  - Multiple NAND flash can be concatenated together to represent a single device
- Flexible, efficient on-chip DC-DC converter
  - Energy saving dynamic power management
- Flexible battery configuration
  - Up to 50 hours of operation on a single AA battery
  - 1xAAA, 2xAA, 2xAAA, Li-Ion\*
- Battery level detection using Low Resolution Analog to Digital Converter (LRADC)
- GPIO and button I/O controls
- LED/LCD Driver
- FM tuner input and control support
- Volume control on record and playback
- Full analog mixer configuration
- <0.05% THD headphone driver, including anti-pop and short-circuit protection
- High performance 18-bit  $\Sigma\Delta$  technology
- Line-in to Line-out SNR >94 dB typical
- Windows® and Macintosh® USB Mass Storage Class support
- Upgradeable firmware
- Bass and Treble control; configurable multiple band control
- Graphical EQ
- Subdirectory Support
- Playlist Support

2xAA, 2xAAA and Li-Ion configurations require 144-pin package. Li-Ion is supported with 100-pin package but several external components are required. MP3 Layer 3 audio coding technology licensed from Fraunhofer IIS and THOMSON multimedia. WMA audio coding technology includes technology owned by Microsoft Licensing, Inc. and cannot be distributed without a license from Microsoft Licensing, Inc.. Windows Media and WMA are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

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MIXED-SIGNAL SEMICONDUCTORS

## PRODUCT FEATURES

FEATURES	STMP3502	STMP3503	STMP3505/3506	STMP3510/3520	STMP3550/3560
Battery life	25	25	50	50	50
USB	2.0 Full Speed	2.0 Full Speed	2.0 Full Speed	2.0 Hi-Speed	2.0 Hi-Speed
Integrated Battery Recharge					✓
Supported battery types	1xAA, 1xAAA	1xAA, 1xAAA	1xAA, 1xAAA, Li-Ion, 2xAA, 2xAAA*	1xAA, 1xAAA, Li-Ion, 2xAA, 2xAAA*	1xAA, 1xAAA, Li-Ion, 2xAA, 2xAAA*
MP3 Encode			STMP3506 only	STMP3520 only	STMP3560 only
Packages	100-pin TQFP	100-pin TQFP	100-pin TQFP 144-pin BGA	100-pin TQFP, 144-pin BGA	100-pin TQFP, 144-pin BGA
LED/LCD	LED/LCD	LED/LCD	LED/LCD	LED/LCD	LED/LCD
FM-in/Line-in and FM Control	✓	✓	✓	✓	✓
Graphical EQ	✓	✓	✓	✓	✓
Subdirectory support	✓	✓	✓	✓	✓
Playlist support	✓	✓	✓	✓	✓
Integrated RTC			✓	✓	✓
Remote Control using LRADC			✓	✓	✓
PDDRM		✓	✓	✓	✓
WMDRM 10/MTP			✓	✓	✓

\*2xAA, 2xAAA and Li-Ion is supported with 100-pin package. Li-Ion is supported with 100-pin package but several external components are required.

