SIGMATEL D-MAJOR™ MP3 FLASH PLAYER APPLICATION BRIEF

FEATURES FOR:
STMP3410/3420/3501/3505/3506/3510/3520/ 3550/3560

- **Decodes MP3 and WMA and is upgradeable to other digital music formats**
- **Supports WMA Digital Rights Management (DRM) and other security schemes**
- **Encodes analog data as MP3 from FM_In, Line_In, or Mic**
- **Includes on-chip read-only unique ID for Digital Rights Management (DRM) algorithms**
- **Hardware supports NAND Flash, SmartMedia, MMC, Secure Digital and CompactFlash.**
- **Flexible, efficient on-chip DC-DC converter**
- **More than 35 hours of operation on a single AA battery**
- **GPIO and button I/O controls**
- **Voice record in ADPCM format**
- **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 >90 dB**
- **Windows and Macintosh USB Mass Storage Class support**
- **Upgradeable firmware**
- **Energy saving dynamic power management**
- **Bass and Treble control; configurable multiple band control**
- **Multiple NAND as 1 drive**
- **Designed to operate with many different battery configurations, including 1xAA, 1xAAA, 2xAA, 2xAAA, Li-Ion***
- **LED/LCD Driver**
- **FM tuner input and control support**
- **Three analog line-level inputs: Line_In (stereo), FM_In, and Mic**
- **Graphical EQ**
- **Subdirectory Support**
- **Playlist Support**
- **Battery level detection using LRADC**

D-MAJOR™ AUDIO DECODER SOLUTIONS FOR MP3 FLASH PLAYERS

SigmaTel's D-Major™ audio decoder solutions are ideal for MP3 flash players. SigmaTel's single-chip solution enables companies to create small MP3 players with a long battery life. SigmaTel integrates all the essential elements for MP3 flash players: USB or Hi-Speed USB, flash interface, DC-DC converter to enable power for the entire device, battery recharge, DAC and headphone amp for music playback, ADC for voice record and MP3 encode, an interface to LED or LCD, and FM Tuner interface and control. Besides offering an integrated single-chip solution, SigmaTel also provides firmware support to operate the device in player mode and when it is connected to the PC in mass storage mode. SigmaTel enables MP3 flash players to use the mass storage drivers included with the Windows and Macintosh operating systems.

With an integrated DC-DC converter that is controlled through firmware, SigmaTel's audio decoder solutions are optimized for lower power consumption. Also, with external circuitry, SigmaTel-based MP3 flash players can power from USB when connected to a PC, further conserving battery power consumption.

SigmaTel audio decoders support MP3 and WMA and are field upgradeable to enable end users to update their MP3 flash players to support the latest audio decoders. In addition to MP3 and WMA decode, MP3 encode is supported on analog Line_In, FM_In, and Mic. WMA Digital Rights Management (DRM) is also supported for copyright-protected audio content.

The SigmaTel D-Major™ audio decoders are ideal for MP3 flash players because of size, integration, low power consumption, and large feature set. SigmaTel offers a complete solution with a single IC and complete firmware support.

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* 2xAA, 2xAAA and Li-Ion configurations require 144-pin package. Li-Ion is supported with 100-pin package but several external components are required.
MPEG 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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SigmaTel, a provider of integrated circuit (IC) design, is converting the real world into a digital experience with its innovative mixed-signal solutions for the digital audio and wireless infrared markets.

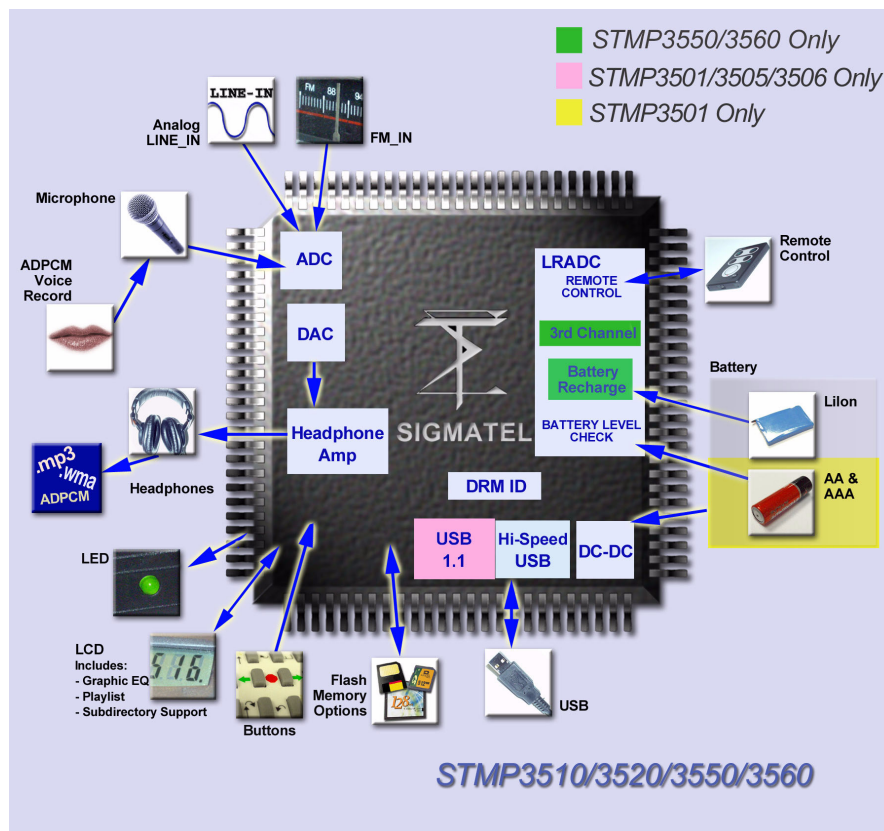# SIGMATEL D-MAJOR™ AUDIO DECODER SOLUTIONS FOR MP3 FLASH PLAYERS

Table 1: Product Features

	Product Name				
Features	STMP3410/3420	STMP3501	STMP3505/ 3506	STMP3510/3520	STMP3550/3560
Battery Life	35	25	50	50	50
USB	USB	USB	USB	Hi-Speed USB	Hi-Speed USB
Integrated Battery recharge					✓
Support Battery Types	1XAA, 1XAAA, Li-Ion, 2XAA, 2XAAA*	1XAA, 1XAAA	1XAA, 1XAAA, Li-Ion, 2XAA, 2XAAA*	1XAA, 1XAAA, Li-Ion, 2XAA, 2XAAA*	1XAA, 1XAAA, Li-Ion, 2XAA, 2XAAA*
MP3 Encode	STMP3420 only		STMP3506 only	STMP3520 only	STMP3560 only
Packages	100-pin TQFP, 144-pin TQFP (STMP3410 only), 144-pin BGA	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
Integrated RTC	✓		✓	✓	✓
Remote Control using LRADC	✓		✓	✓	✓
DSP Speed	65 MHz	75 MHz	75 MHz	75 MHz	75MHz
FM-In/Line_In and FM 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.					

STMP3510/3520/3550/3560

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