

Integrated Mixed-Signal Solutions

PRODUCT BRIEF

STMP3400

**Audio Decoder with USB Interface
and Voice Record**

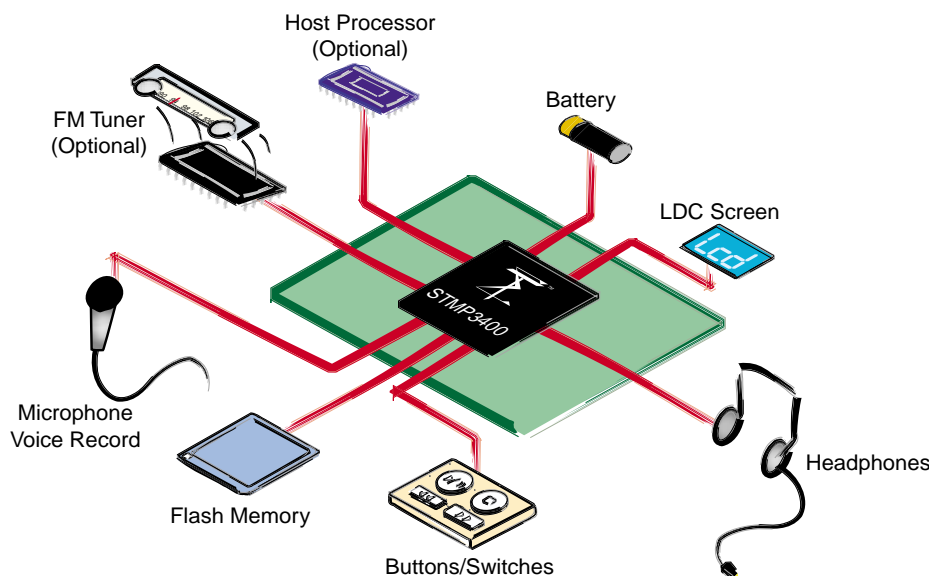
FEATURES

- MP3 decode
- NAND Flash, SmartMedia, MMC, Secure Digital, CompactFlash, and IDE Support
- Designed for up to 20 hour operation from AA battery, as well as other battery options
- USB download interface
- LCD Interface
- GPIO and button I/O controls
- Voice record in ADPCM format
- Volume control on record and playback
- Full analog mixer configuration
- Drive headphones directly
- High performance 18-bit $\Sigma\Delta$ technology
- LINE-to-LINE SNR >95 dB
- USB download drivers
- Interface to a host chip/processor
- Upgradeable firmware
- DSP maximum speed is 50 MHz
- Supports SDMI
- Energy saving dynamic power management
- Bass and Treble control; configurable multiple band control
- FM radio input and control support
- Three analog line-level inputs: Line_In, FM_In, and Mic
- 100-pin LQFP
- Crystal rate is 24.576 MHz

DESCRIPTION

SigmaTel's STMP3400 is a single-chip digital music system for dedicated audio players, PDAs and cell phones. It includes an audio decoder with a high performance DSP, ADPCM record capabilities and a USB interface for downloading music and uploading voice recordings. STMP3400 also provides an interface to flash memory, LCD, button and switch inputs, head-

phones, microphone and FM radio input and control. The STMP3400's programmable architecture supports the MP3 digital audio standard. The end-user can update software on through USB. For devices like PDAs and cell phones, STMP3400 can act as a slave chip to a host chip/processor. The STMP3400 has low power consumption to allow long battery life with a AA or AAA battery. The DACs include a headphone driver to directly drive low impedance headphones. The ADCs include inputs for both Microphone and Analog Audio In to support voice recording and FM radio. SigmaTel's proprietary Sigma-Delta ($\Sigma\Delta$) technology achieves a DAC SNR in excess of 95 dB. The STMP3400 is compliant with Phase 1 of the Secure Digital Music Initiative (SDMI).

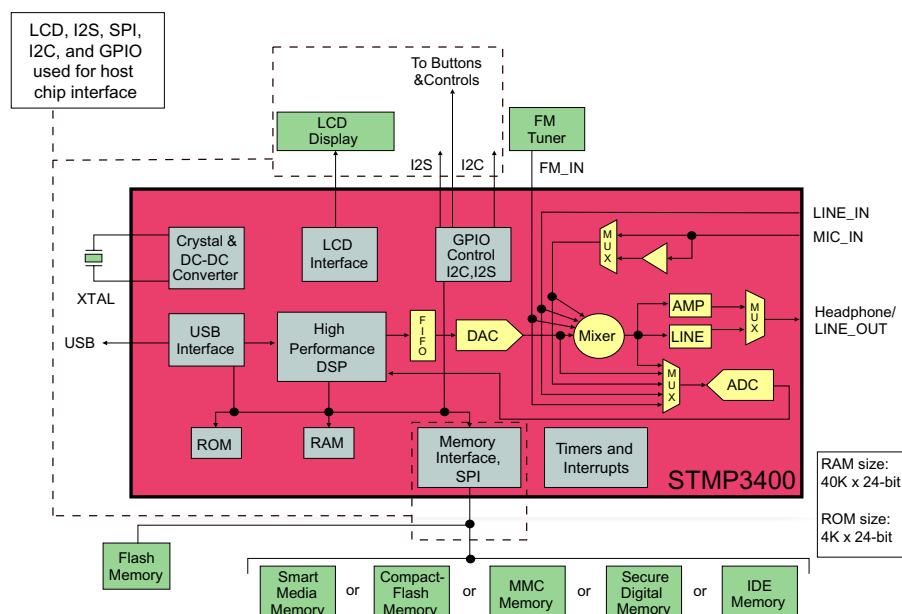


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STMP3400 DIAGRAM



ORDERING INFORMATION

Part Number	Package	Temp Range	Supply Range
STMP3400	100-pin LQFP 16mm x 16mm x 1.6mm	0 °C to +70 °C	AVdd = 2.0–2.75V, DVdd = 2.0–2.75V, IOVdd = 2.7–3.3V

KEY SPECIFICATIONS

- MP3 decoding algorithm support
- Upgradeable firmware
- Memory support - NAND, SmartMedia, Secure Digital, MMC, CompactFlash, IDE, and NOR
- Power consumption:
 - ◆ AA battery up to 20 hours
 - ◆ Other battery options are available
 - ◆ < 200 mW during playback (including Flash, LCD, Headphone, and DSP)
- Voice record capability with compression
- Level of integration with implementation flexibility
- Act as host chip on a device or as a slave chip to a host processor

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MEMORY SUPPORT

Maximum size of each memory device:

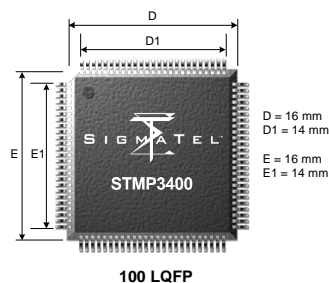
- ◆ SmartMedia or NAND Flash: 256 MB
- ◆ CompactFlash: 1 GB
- ◆ MMC, Secure Digital: 256 MB
- ◆ IDE: no maximum

STMP3400 AND SDMI 1.0 COMPLIANCE

- ◆ Recording capabilities restricted to mono voice-grade
- ◆ Playback and seek only occurs at "normal speeds"
- ◆ Save a unique ID number to on-board or external flash with a minimum length of
 - 128 bits, if randomly assigned or
 - 32 bits, if uniquely assigned by an appropriate assignment authority or licenser designated by SDMI

Note: A software upgrade will be available to upgrade to SDMI 2.0 after the specification has been finalized.

PACKAGE TYPE



SOFTWARE DETAILS

Software Included with STMP3400:

- ◆ System software distributed as source code
- ◆ Decoders distributed as object code
- ◆ USB Driver Software for the host PC

DEVELOPMENT TOOLS INCLUDED

- ◆ 56K DSP design tools from Tasking which include assembler, compiler, linker, debugger, and simulator.
- ◆ SigmaTel library of functions, including DAC and ADC driver, memory and LCD control, and voice recording
- ◆ Command converter hardware to download code to STMP3400 for debug
- ◆ Example Programs

PROGRAM CODE

- ◆ Flash System is based on FAT 12. Future versions will be based on FAT 16, FAT 32 and ISO 9660 for CDROMs.
- ◆ Amount of off-chip memory required for program code is 83 kbytes–185 kbytes depending on functionality. Additional program space, which varies from application to application, will be required for bitmap, text, and menu files required for the LCD.

ADDITIONAL SUPPORT

Additional product and company information can be obtained by going to the SigmaTel website at:

www.sigmatel.com