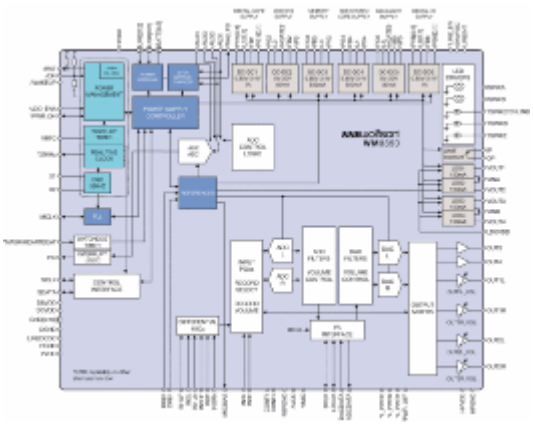
Products : Power Management

WM8350 : Stereo CODEC with Integrated Power Management



FEATURES

- **Stereo Hi-Fi CODEC**
- DAC SNR 95dB ('A' weighted @ 48kHz), THD -81dB
- ADC SNR 95dB ('A' weighted @ 48kHz), THD -83dB
- 40mW on-chip headphone driver with 'capless' option
- 16Ω headphone load: THD –72dB, Po = 20mW
- 2 differential microphone inputs with low-noise bias voltage and programmable preamps
- Programmable high-pass filter for ADC
- Microphone and Headphone detection
- Auxiliary inputs for analogue signals
- Sample rates: 8, 11.025, 16, 22.05, 24, 32, 44.1 or 48kHz
- **System Control**
- Support for I2C or SPI Control Interface
- Handles power sequencing, reset signals and fault conditions
- Autonomous power source selection (battery, wall adaptor or USB bus)
- Total current drawn from USB bus is limited to comply with USB 2.0 standard and USB OTG supplement
- **Supply Generation**
- 2 x DC-DC Buck Converters (0.85V - 3.4V, Up to

DESCRIPTION

The WM8350 is an integrated audio and power management subsystem which provides a cost effective, single-chip solution for portable audio and multimedia systems.

The integrated audio CODEC provides all the necessary functions for high-quality stereo recording and playback. Programmable on-chip amplifiers allow for the direct connection of headphones and microphones with a minimum of external components. A programmable low-noise bias voltage is available to feed one or more electret microphones. Additional audio features include programmable high-pass filter in the ADC input path.

The WM8350 includes six programmable DC-DC converters, four low-dropout (LDO) regulators and a current limit switch to generate suitable supply voltages for each part of the system, including the integrated audio CODEC as well as off-chip components such as a digital core and IO supplies, and LED lighting. An additional on-chip regulator maintains the backup power for always-on functions. The WM8350 can be powered by a lithium battery, by a wall adaptor or USB.

An on-chip battery charger supports both trickle charging and fast (constant current, constant voltage) charging of single-cell lithium batteries. The charge current, termination voltage, and charger time-out are programmable to suit different types of batteries.

Internal power management circuitry controls the start-up and shutdown sequencing of clocks and supply voltages. It also detects and handles conditions such as under-voltage, extreme temperatures, and deeply discharged or defective batteries, with a minimum of software involvement. Two programmable constant-current sinks are available for driving LED strings, e.g. for display backlights or photo-flash applications, in a highly power-efficient way. Additional RGB LEDs can be driven through GPIO pins.

The WM8350 includes a 32.768kHz crystal oscillator,

1A)
- 2 x DC-DC Buck Converters (0.85V - 3.4V, Up to 500mA)
- 2 x DC-DC Boost Converters (5V - 20V, 40 to 200mA)
- 4 x LDO voltage regulators (0.9V - 3.4V, 150mA)
- **LED Drivers**
- 2 programmable constant-current sinks, suitable for screen backlight or white LED photo flash
- 3 open-drain outputs for RGB LEDs
- **Battery Charger**
- Single-cell Li-on / Li-Pol battery charger
- Thermal protection for charge control; temperature monitoring available for thermal regulation
- LED outputs to indicate charge status and fault conditions
- **Additional Features**
- “Always on” RTC with wake-up alarm
- Watchdog timer
- Up to 13 configurable GPIO pins
- On-chip crystal oscillator and internal RC oscillator
- Low power FLL supporting 32kHz to 19.2MHz input clocks
- 7x7mm, 129 BGA package, 0.5mm ball pitch

an internal RC oscillator, a real time clock (RTC) and an alarm function capable of waking up the system. Internal circuitry can independently generate all clock signals required to start up.

The master clock can be input directly or generated internally by an integrated low power FLL. This master clock can be used to drive low-jitter audio clocks from reference clocks of 5 to 20MHz.

To extend battery life, fine-grained power management enables each function in the WM8350 to be independently powered down through the control interface.