

AT73C246

Power Management Unit and Stereo Audio Codec

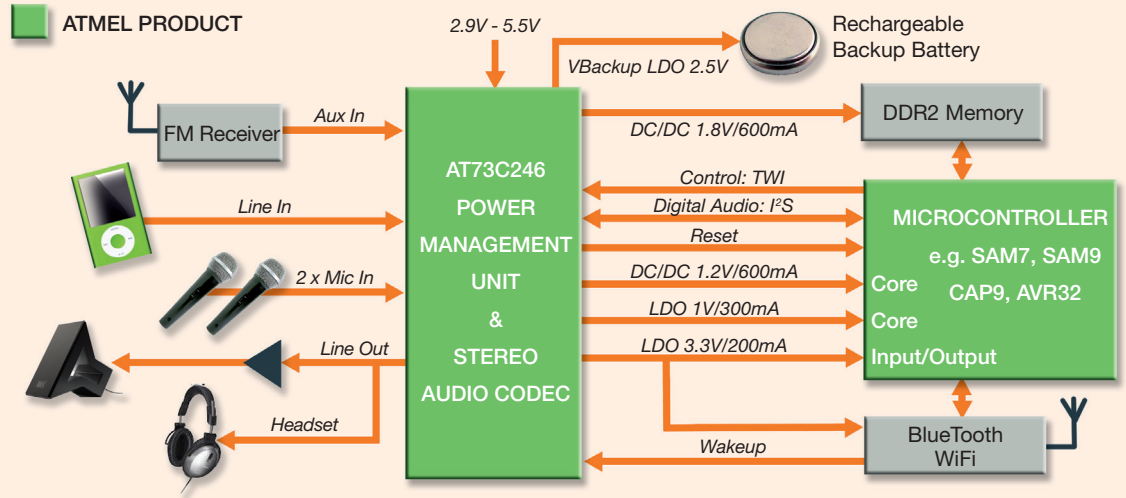
Multimedia systems such as portable media players are typically built around a microcontroller, memories, wireless communications ICs and audio input/output devices. The keys to their success are their audio quality and their power efficiency.

Atmel's AT73C246 is the ideal power management unit and stereo audio interface for such systems. It integrates, in a single device, a high-quality audio codec and multiple power supplies that are precisely adapted to the requirements of an MCU-based multimedia system. In particular, the AT73C246 is designed to interface directly to Atmel's AT91SAM9 and AT91CAP9 families of ARM9™- based microcontrollers and their DDR2 memories.

The AT73C246 reduces the system chip count by replacing a number of discrete voltage regulators. Operating from a single 2.9V to 5.5V power supply, it provides precisely calibrated voltages to all the other components of the system, and enables these components to be powered down selectively when not required. This keeps system power consumption to a minimum under all conditions of use.

The AT73C246 also provides high quality audio. It multiplexes the stereo inputs from two microphones, a line in and an auxiliary input, and provides stereo output for headphones or an external speaker amplifier. The audio inputs can be channeled directly to the output or digitized and transferred to the MCU for recording or processing. In playback mode, digital signals originating from the MCU are converted to high-fidelity analog for output.

By its high level of integration, precisely calibrated power supplies, configurable power management and high-quality audio, the AT73C246 reduces the cost, board space and power consumption of a wide range of multimedia applications while enhancing the sound quality.

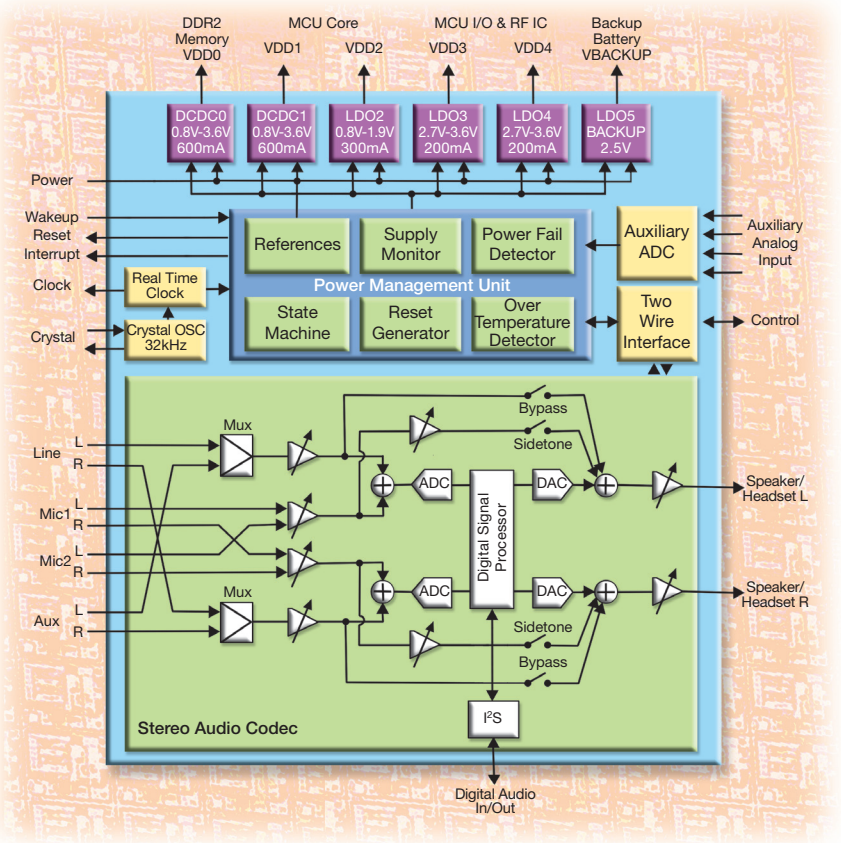


AT73C246 Application Example



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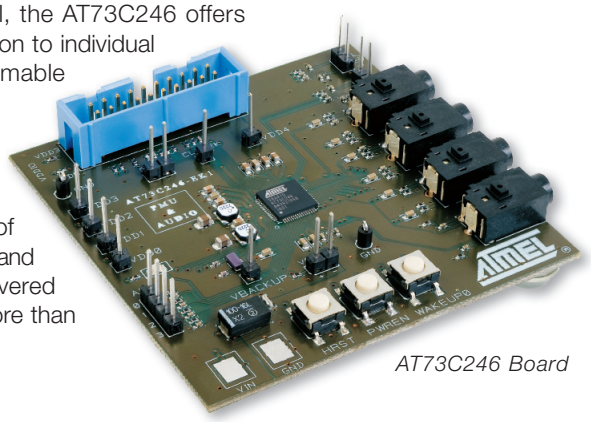


The audio input of the AT73C246 is built around a stereo ADC with a 96dB dynamic range. It multiplexes/mixes the inputs required by the majority of multimedia systems: two stereo microphones, an auxiliary input from, for example, a FM receiver, and a line in from, for example, a digital media player. The audio input can be passed directly to the stereo output if required, in bypass or sidetone mode that significantly reduces power consumption. Otherwise the audio stream is digitized and transferred to the MCU via the industry-standard I²S bus.

Digital sound output is transferred from the MCU via the I²S bus before passing through a 100dB dynamic range stereo DAC and output amplifiers that can directly drive a 60mW 16/32Ohm headset, or feed the input of a stereo speaker amplifier. These highly integrated audio features offer unsurpassed sound quality.

The PMU of the AT73C246 is built around a dedicated set of voltage regulators, each configurable in 50mV steps to provide precisely the voltage, current and noise immunity required by the MCU core and its I/Os, and also the memory and RF/analog sections in the multimedia system. Each supply channel features fast and accurate transient load responses, automatic ramping (digital voltage scaling), output voltage monitoring, and over-current protection. Through its TWI bus control, the AT73C246 offers numerous possibilities for power optimization. In addition to individual function shutdown, it saves power with a fully programmable standby and wake-up scenario where the application can be partially or fully powered down.

To further reduce the bill-of-materials and space requirements of the multimedia system, the AT73C246 also integrates a real-time-clock generator and a set of auxiliary analog inputs that drive a 10-bit ADC for sensing and measurement functions. Finally, the AT73C246 is delivered in a compact 7.5x7.5mm QFN package that saves more than 30% of board space over alternative solutions.



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