UAC 355xB
Universal Serial Bus (USB) Codec

UAC 355xB is Micronas' new USB audio IC. It contains a high-performance stereo audio ADC/DAC, digital serial interfaces, and an additional DAC channel for the subwoofer signal.

The UAC 355xB offers a programmable 5-band parametric equalizer for correcting the frequency response of the applied speaker plus adjustable dynamic low-frequency processing for the subwoofer channel. All sampling rates for USB record and playback are handled independently.

The codec functionality of the UAC 355xB is extended by additional interfaces, like I^2S, allowing all kinds of digital audio processing systems to be connected to the USB, e. g. Dolby Digital or MP3 decoding chips, such as DPL 4519G / MAS 3528E, or MAS 35x9F.

General-purpose inputs and outputs connect the UAC 355xB to peripheral hardware such as buttons, keyboards, LEDs etc. Via I^2C, more complex peripherals like LCD displays can be controlled.

The UAC 355xB itself can be remote-controlled via I^2C in non-USB environments.

All in all, the IC is designed as the ideal connecting matrix between USB, analog and digital audio input and output, home stereo, compressed audio, and all kinds of human interface devices.

Micronas supplies a standard ROM firmware based on the USB Composite Class, Audio Class, and HID Class.

Features

◆ Single-chip USB 2.0 full-speed compliant stereo audio ADC and DAC

◆ Adaptive isochronous endpoints for playback and record USB Audio

◆ Supports 16-bit mono/stereo and 24-bit stereo for playback (D/A converter)

◆ Supports 8-bit mono and 16-bit mono/stereo, for record (A/D converter)

◆ Generic ISO-playback endpoint (Dolby Digital, MP3)

◆ USB programmable device and configuration descriptor

◆ Bus- or self-powered configurations

◆ Remote wake-up

◆ 12 general-purpose I/O pins

◆ I^2S input/output interface

◆ independent adaptive sample rates of 6.4 to 48 kHz for USB record and playback (enhanced full-duplex)

◆ Audio baseband control: bass, treble, loudness, volume, balance, and mute

◆ Dynamic bass management (Micronas Dynamic Bass=MDB)

◆ Digital speaker equalizer (5-band parametric equalizer)

◆ Adjustable digital subwoofer filter

◆ THD better than −85 dB and SNR of typ. 96 dB for D/A converters

◆ THD better than −85 dB and SNR of typ. 92 dB for A/D converters

◆ Integrated stereo headphone amplifier

◆ Subwoofer output with internal split filter

◆ I^2C interface (master/slave)

◆ Bootable firmware for µC (UAC 3556B)

◆ Customized firmware extensions possible via plug-ins

◆ On-chip analog filters for out-of-band noise suppression

◆ Packages: PQFN64, PMQFP64, and PMQFP44

Applications

The high-performance audio ADC with direct microphone and line input makes the UAC 355xB the ideal solution for all kinds of USB codec applications. This includes the replacement of analog sound cards in PCs. Integrated headphone amplifiers allow direct headphone connection. Therefore, the IC can be employed as a single-chip headset solution without an extra power supply (bus-powered).
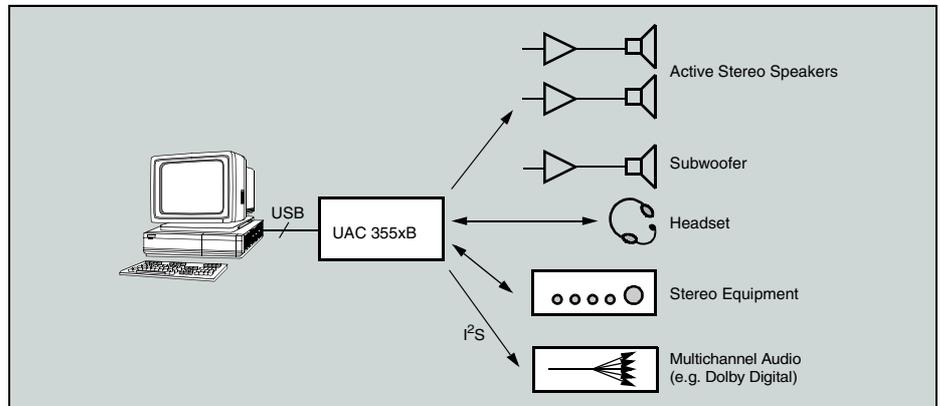

Fig. 1: Typical applications for the UAC 355xB

Versions

Members of the UAC 355xB Family

Version	Description
UAC 3556B	Universal Serial Bus (USB) codec with standard ROM firmware and boot-loader for 8-kByte firmware download
UAC 3554B	mask-programmed version
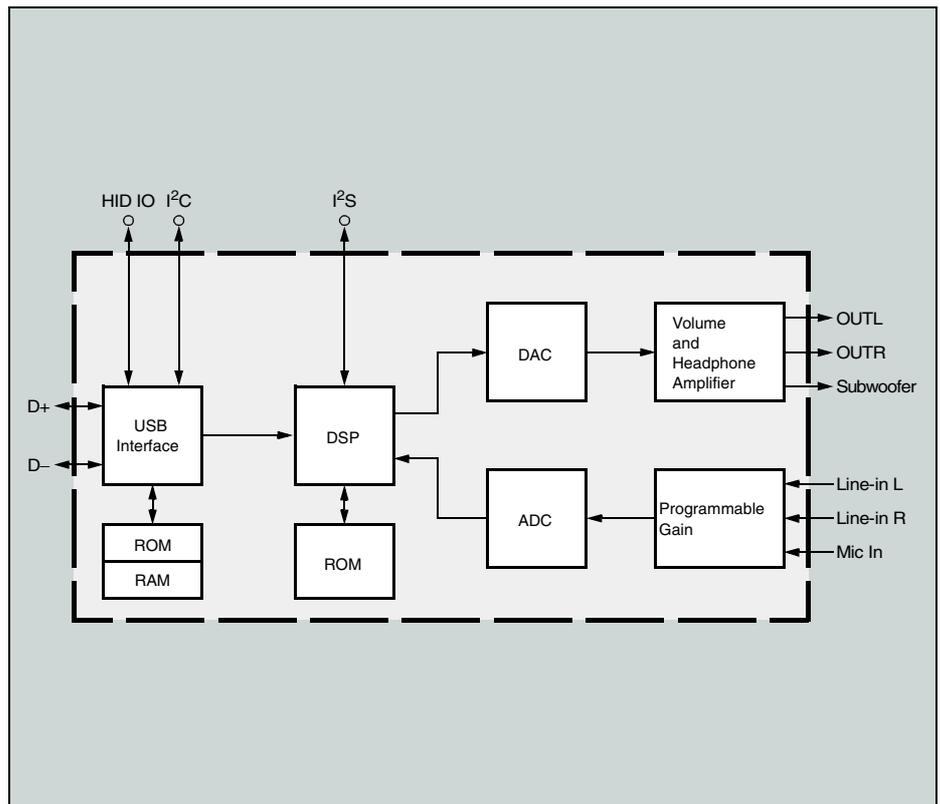
Fig. 2: Block diagram of the UAC 355xB