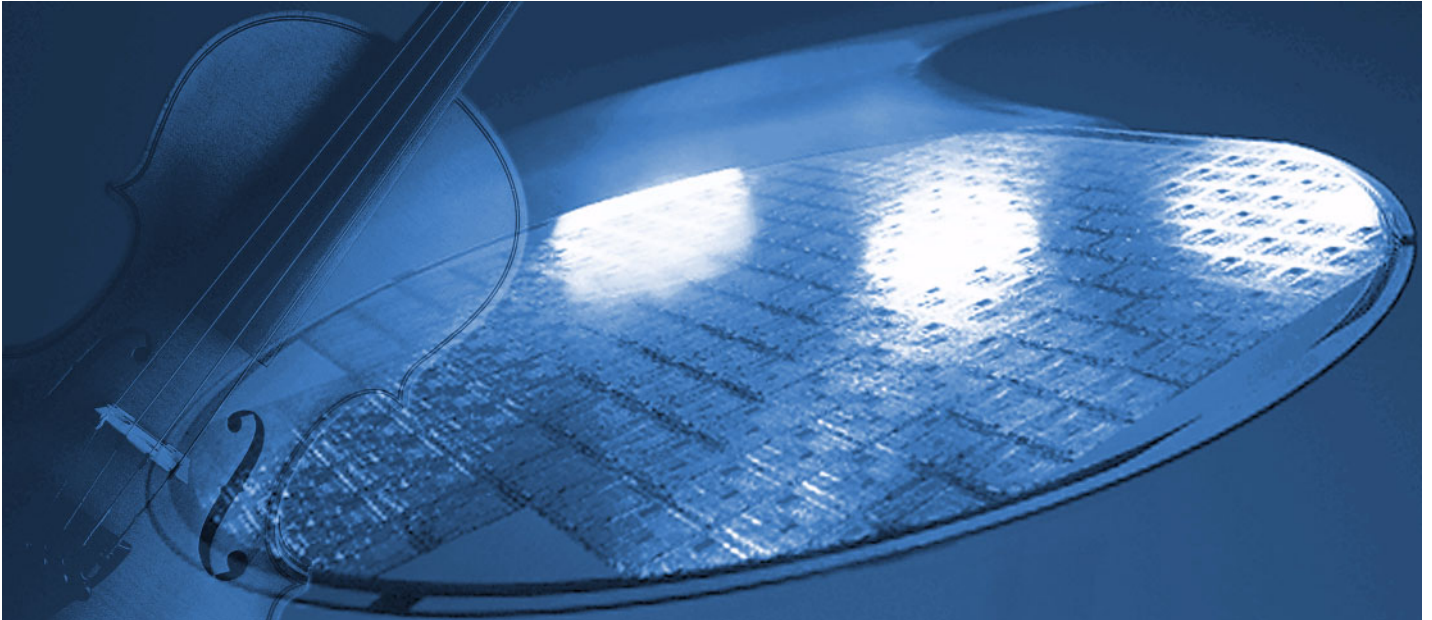




# UAC 357xB

Aug/2004



## UAC 357xB Universal Serial Bus (USB) Codec



The UAC 357xB is a new member of Micronas' USB audio IC family. It contains a high-performance stereo audio ADC/DAC and digital interfaces for audio or control data.

The audio ADC with direct dual microphone and pseudo-differential stereo line input makes the UAC 357xB the ideal solution for all kinds of USB audio applications. This includes the replacement of analog sound cards in PCs. Integrated headphone amplifiers allow direct capless headphone connection. Therefore, the IC can be employed as a single-chip headset solution without extra power supply (bus-powered).

In home stereo applications with PC-link the output allows noise-reduced coupling to external ground systems making active ground coupling circuitry obsolete. Analog input signals can be pseudo-differentially coupled to reduce ground noise problems.

The UAC 357xB offers a programmable 5-band parametric equalizer for correcting the frequency response of the applied speaker. Internal sample rate converters offer high flexibility in handling all sample rates for USB upstream and downstream independently.

The UAC 357xB allows 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 35xyH, or MAS 35x9F.

General-purpose inputs and outputs connect the UAC 357xB to peripheral hardware, such as buttons, keyboards, LEDs, etc. Via I<sup>2</sup>C, more complex peripherals, such as LCD displays can be controlled. The UAC 357xB has a built-in I<sup>2</sup>C master and slave controller. The slave allows the control of all device features in USB-connected or unconnected states. This enables the device to be utilized as a stand-alone audio processor with built-in ADCs and DACs, as well as building a communication bridge across the USB link via I<sup>2</sup>C.

The firmware plug-in download functionality turns the UAC 357xB into a customer-specific IC. Micronas supplies standard ROM firmware based on the USB composite class, audio class, and HID class, supporting headset/general codec applications.

The IC is the ideal connecting matrix between USB, analog and digital audio input and output, home stereo, compressed audio, and human interface devices.

### Main Features

- ◆ Single-chip, full-speed USB 2.0 compliant, stereo audio ADC and DAC
- ◆ Dual microphone input
- ◆ Pseudo-differential line input
- ◆ Capless headphone connection
- ◆ Output reference for ground noise cancellation
- ◆ Supports 8/16-bit mono/stereo recording and up to 24-bit playback
- ◆ Supports streaming of compressed audio (Dolby Digital, MP3) to external decoders
- ◆ Vendor ID, product ID, strings and device configuration with external EEPROM
- ◆ Bus-powered or self-powered mode
- ◆ 12 GPIO pins with HID support
- ◆ I<sup>2</sup>S input/output interface
- ◆ Integrated stereo headphone amplifier
- ◆ I<sup>2</sup>C interface (master/slave)
- ◆ Customized firmware extensions with plug-ins possible
- ◆ Packages: PMQFP64-2 or PQFN64-1

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## Audio Features

- ◆ Independent adaptive sample rates of 6.4 to 48 kHz for USB recording and playback (enhanced full-duplex)
- ◆ Audio baseband control: bass, treble, loudness, volume, balance, and mute
- ◆ Dynamic bass management (Micronas Bass MB)
- ◆ Digital speaker equalizer (5-band parametric equalizer)
- ◆ THD better than -90 dB and SNR of typically 96 dB for D/A converters
- ◆ THD better than -90 dB and SNR of typically 92 dB for A/D converters
- ◆ Power supply rejection ratio >95 dB for analog outputs

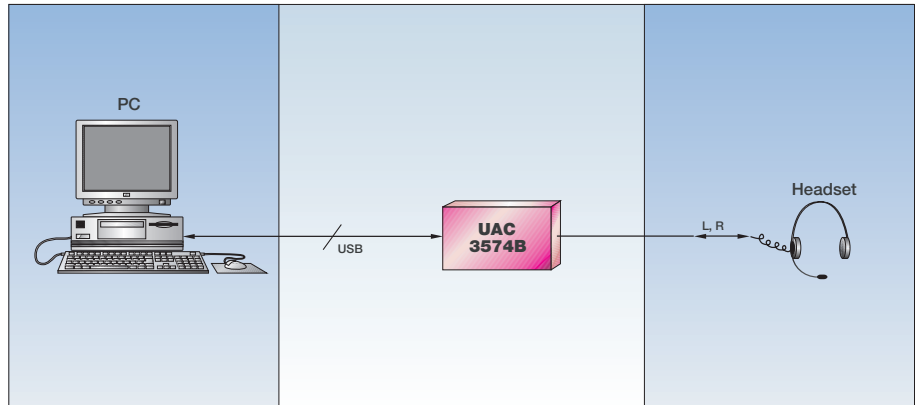


Fig. 1: Typical headset application

## Members of the UAC 357xB Family

The three family members are optimized for different applications and needs. The UAC 3574B is ideally suited for self-powered USB headset applications. The UAC 3575B offers additional stereo line input support. The UAC 3576B adds the flexibility to boot customized firmware from an external EEPROM of up to 8 kB. A firmware SDK implementing all standard USB control, audio, and HID class features is available.

Version	Description
UAC 3574B	USB headset
UAC 3575B	USB codec
UAC 3576B	USB codec – with 8 kB RAM for firmware download

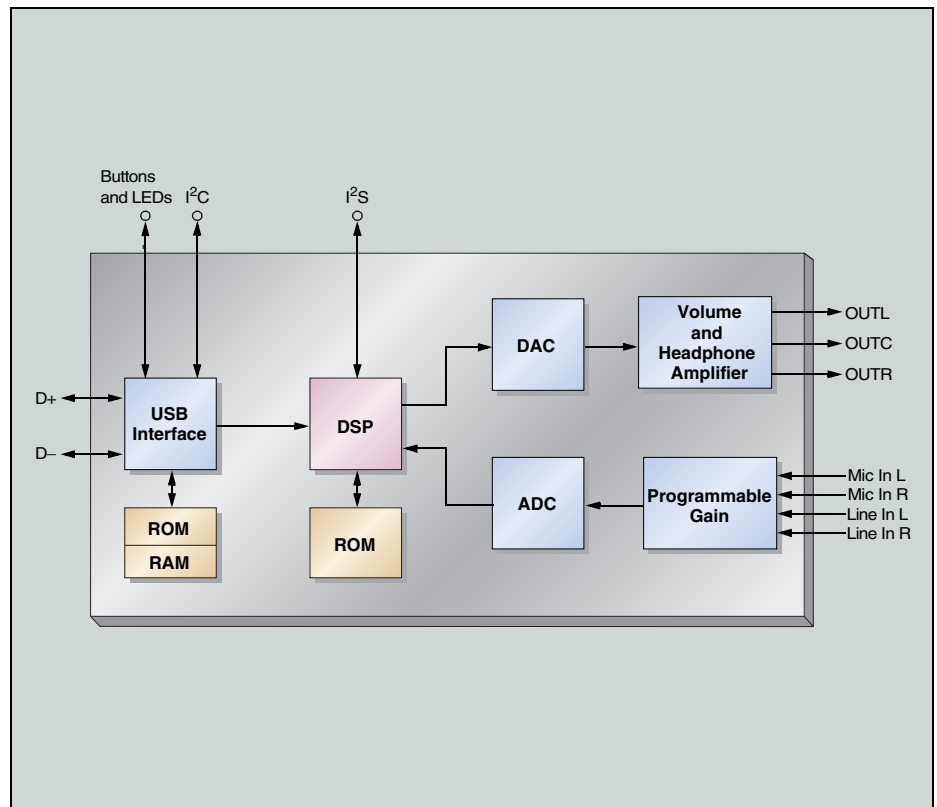


Fig. 2: Block diagram of the UAC 357xB

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