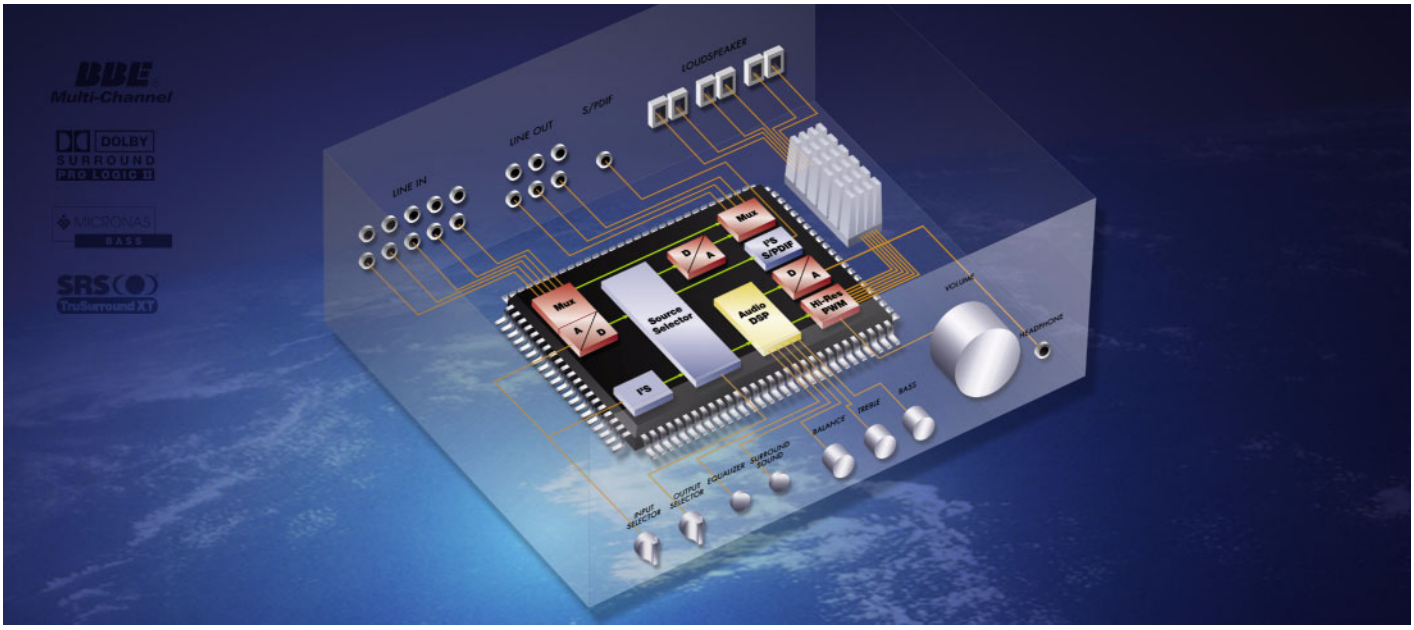
MAP 44/460xA

Aug/2004



MAP 44/460xA
Micronas Audio Processor

The Micronas Audio Processor family MAP 44/460xA includes all functions and building blocks required in consumer audio applications. Reducing system costs, the ICs are equipped with analog inputs and outputs, as well as digital interfaces. The integrated DSP performs the basic processing of 2.0 up to 5.1 Dolby Pro Logic II multichannel audio.

With the extension of a Micronas MAS 35xyH coprocessor, a complete DTS and Dolby Digital 5.1-channel home audio decoder/amplifier can be realized. Further available extensions are the USB audio codec UAC 355yB and the “lip sync” audio delay line MAD 4868A.

Being processed in the DSP section of MAP 44/460xA, a variety of Micronas audio technologies and well known 3rd party audio technologies are available. Built-in high-quality D/A converters feed analog power amplifiers. Alternatively, digital outputs allow to connect state-of-the-art “class-D” digital amplifiers. Micronas’ “Hi-Resolution PWM” technology enables detail-rich and natural sound.

Applications

- Home Theater Systems
- Surround Sound AV Amplifiers
- Home Theater in a Box (HTiB)
- Mini/Midi Component Stereo
- Hi-Fi components
- 2.0/2.1-channel Audio systems
- Multimedia Audio
- Automotive Sound Systems

Audio Processing

- Dolby Pro Logic II and Virtual Dolby Surround Pro Logic II
- SRS TruSurround XT and SRS WOW
- BBE Multi-Channel HD Sound
- Micronas BASS bass enhancement
- Micronas SOUNDFIELD processing: Cathedral, Jazz Club, Karaoke, …
- Bass/Treble or 7-band Graphic Equalizer
- 3-band Parametric Equalizer
- Micronas NIGHT dynamic limiter and speech enhancement processing
- Programmable subwoofer filter
- ROM mask-programmed DSP; no software downloads necessary

Interfaces and I/O

- 5 stereo line inputs and 3 stereo line outputs (2 V_{RMS})
- Full switching matrix (any input to any output)
- S/PDIF output (PCM stereo)
- Multichannel I^2S inputs with adaptive sampling rate converter
- 2 A/D converters with 95 dBA dynamic range (typ.)
- 6 D/A converters with analog volume (MAP 440xA), with 95 dBA dynamic range (typ.)
- 6 “Hi-Resolution PWM” outputs for loudspeakers (MAP 460xA)
- 2 D/A converters with analog volume for headphone/aux out
- 4 line D/A converters (2 V_{RMS})

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Miscellaneous

- Pin- and software-compatible IC family. The family member chips differ in:
  - analog vs. digital loudspeaker output
  - 2.1- vs. 5.1-ch. loudspeaker support
  - Features and I/Os available in groups
- Very few external components only
- All functions programmable via I^2C bus
- Packages:
  PMQFP80-11 (0.8 mm pitch) and
  PMQFP100-1 (0.5 mm pitch).

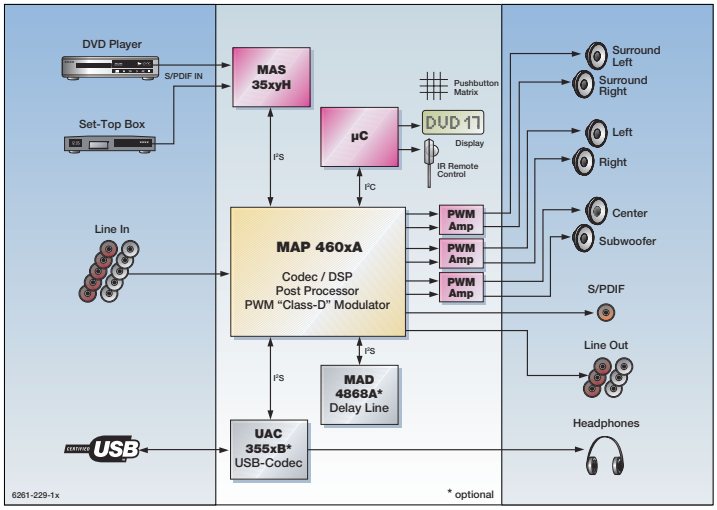

Fig. 1: Typical application

System Architecture

The hardware of the MAP 44/460xA consists of digital audio processing units in the DSP, as well as analog I/O including high-performance A/D and multibit sigma-delta D/A converters with oversampling digital interpolation filters. Additionally, an on-chip PWM modulator driven by Micronas "Hi-Resolution PWM" technology is available.

The DSP is designed as a dedicated audio signal processor. Its RISC architecture makes it small and cost-efficient, while providing sufficient power to process multiple audio algorithms. The DSP software is completely written in Assembler, avoiding C-compiler overhead, while optimum usage of the DSP resources is ensured. The Assembler code is optimized to provide best audio performance. All program code is located in the internal ROM; no download has to be performed during power-up and no ROM for audio algorithms is needed on the system controller.

Fully specified for audio applications, the mixed-signal chips' analog components interface ideally to the DSP part, minimizing the number of external components.

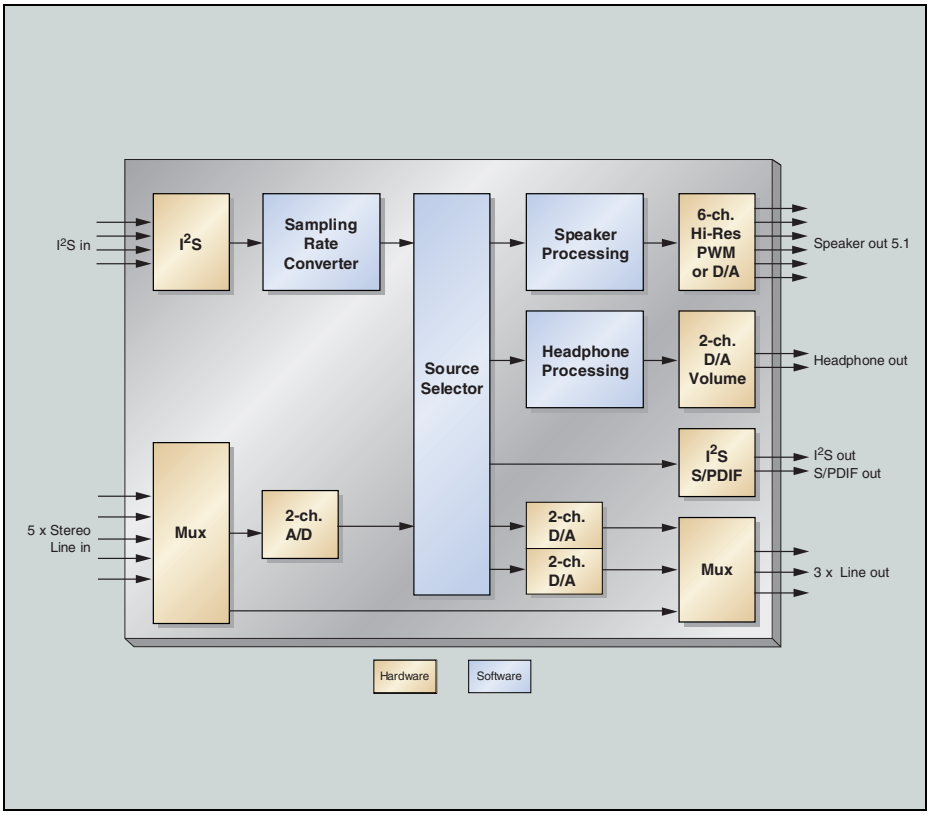

Fig. 2: Block diagram of the MAP 44/460xA

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