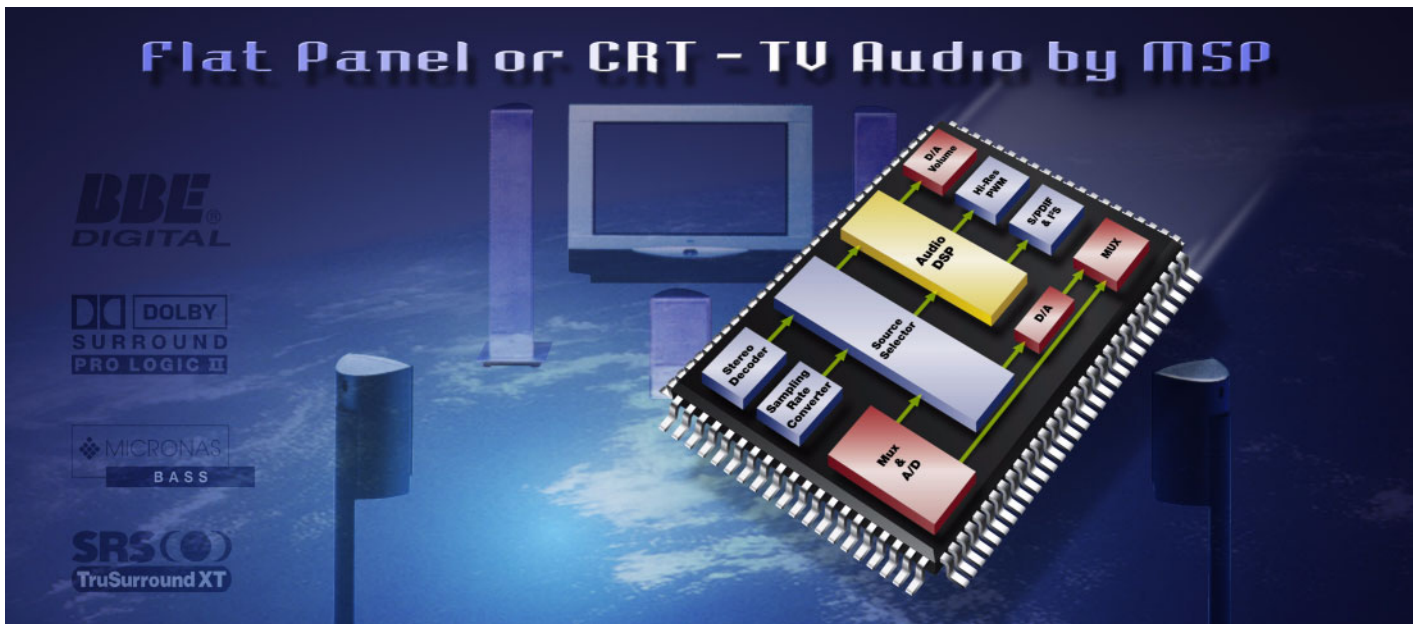# MSP 44xyK, MSP 46xyK

July/2003

MSP 44xyK, MSP 46xyK
Multistandard Sound Processor Familiy

The Multistandard Sound Processor families MSP 44xyK and MSP 46xyK represent the fifth generation of Micronas' single-chip TV sound demodulator, decoder, and baseband audio processors.

Demodulation and stereo decoding of all analog TV standards worldwide, as well as the NICAM digital sound standard and FM stereo radio is performed on the SIF (2nd IF) input.

Baseband audio is processed in the DSP section after on-chip A/D conversion or input via I^2S. Built-in high-quality multibit sigma-delta D/A converters directly feed the TV's power amplifiers. Alternatively, digital PWM outputs allow to connect state-of-the-art "class D" digital amplifiers. Micronas' "High-Resolution PWM" technology enables natural sound with digital power amplifier ICs provided by several manufacturers.

MSP 44xyK and MSP 46xyK are available in PQFP80 or PQFP100 package.

Demodulator, Stereo Decoder

◆ Alignment-free decoding of all TV audio standards maintaining superb channel separation

◆ US BTSC audio with DBX noise reduction and SAP decoding

◆ Japanese EIA-J stereo

◆ Digital NICAM stereo

◆ All 2-carrier TV Audio standards

◆ (Very) High deviation modes HDEV2, 3

◆ Automatic Standard Detection (ASD)

◆ Automatic Sound Select (ASS) switches mono/stereo/bilingual without controller interaction

Baseband Audio Processing

◆ Delay line for "Lip Sync"

◆ Dolby Pro Logic II

◆ SRS TruSurround XT

◆ BBE High Definition Sound

◆ Virtual Dolby Surround

◆ Equalizer, Tone control, Subwoofer filter

◆ Micronas BASS, Micronas VOICE

Interfaces

◆ Two SIF inputs to the Demodulator

◆ 8-channel I^2S inputs with sampling rate converter

◆ 5 analog stereo line inputs (to A/D or switched to line outputs)

◆ Loudspeaker D/A for L, C, R, Sl, Sr, Sub channels with analog volume

◆ "High-Resolution PWM" outputs with volume for L, C, R, Sl, Sr, Sub channels

◆ Headphone D/A with analog volume

◆ I^2S outputs

◆ S/PDIF output

◆ Easy connection of Micronas' MAS 35xyH co-processors

MSP 44xyK, MSP 46xyK

Evaluation Support

◆ "Visual MSP" Software Suite:
- I^2C driver for PC parallel port
- Micronas "Visual I^2C"
- "Visual-MSP" application

◆ Evaluation Hardware:
- I^2C adapter for PC parallel port
- Micronas Audio Motherboard
- Various evaluation boards

MSP 44xyK, MSP 46xyK Family Differentiation

Feature	MSP 44x1K	MSP 44x2K	MSP 46x1K	MSP 46x2K
"High-Resolution PWM"	–	–	●	●
Loudspeaker out	2.1 ch	5.1 ch	2.1 ch	5.1 ch
Dolby Pro Logic II	–	●	–	●
Virtual Dolby Surround	●	●	●	●
Micronas BASS	●	●	●	●
SRS TruSurround XT BBE High-Definition Sound	optional	optional	optional	optional

System Architecture

The hardware of the MSP 44xyK and MSP 46xyK consists of digital data processing blocks, as well as analog I/O including high-performance A/D and D/A conversion on a single chip.

The unique demodulator block performs all SIF demodulation, stereo decoding and automatic functions in the digital domain.

The DSP is designed as dedicated audio signal processor. Its RISC architecture makes it small and cost-efficient while providing sufficient power to process Pro Logic II followed by TV-specific signal processing and "High Resolution PWM".

The firmware is located in the internal ROM; all functions are I^2C-programmable. MSP 44xyK are hardware and software compatible to Micronas MSP34xyG and MSP44xyG products.

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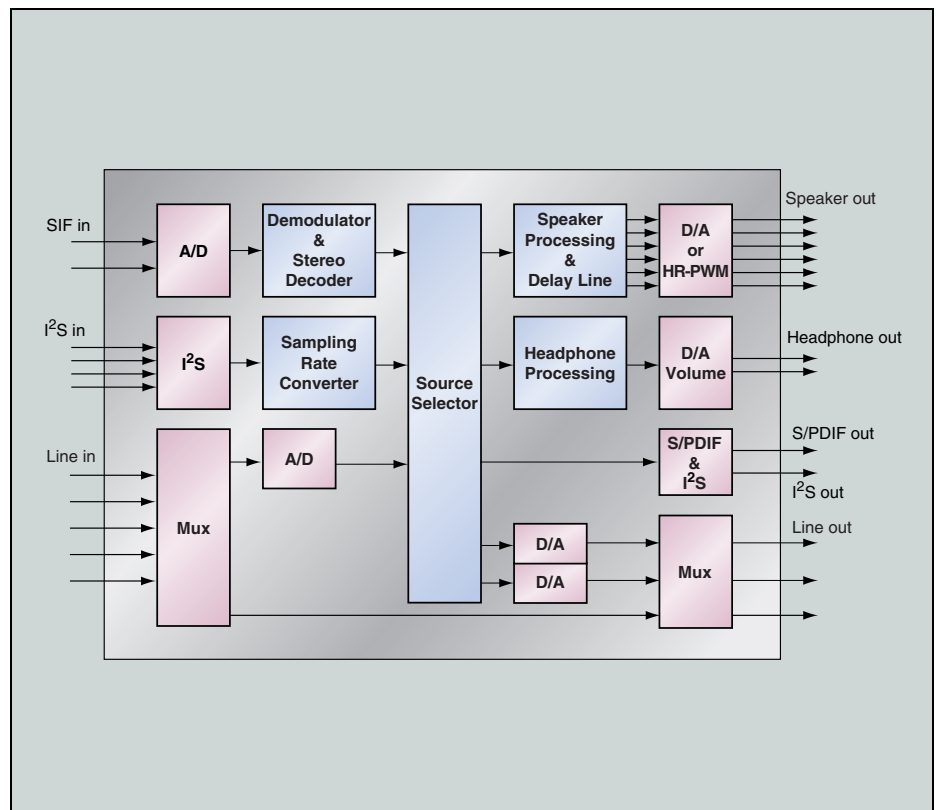

Fig. 1: Block diagram of the MSP 44xyK and MSP 46xyK