SAA7134 PCI 9-Bit Video/Stereo Decoder

Advantages

Audio Support
• On-chip hardware TV-stereo decoder supports NICAM and Dual FM
• Synchronized audio-video streams
• Two pairs of analog (stereo) inputs and source select for integrated analog audio pass-through to loop-back cable support

Video Support
• Two 9-bit Analog-to-Digital Converters (ADCs)
• High-performance adaptive 4-line comb filter supports all sources, including VCR and broadcast
• Macrovision detection with active-status interrupt
• Integrated anti-alias filters
• 27 MHz MPEG-Comprable Clock

Digital Broadcast Support
• Transport-stream capture and DMA
• Direct VSB/COFDM/QAM support via dedicated “sidecar” output, ADC for DTV-DVB channel decode
• Video-out/MPEG-in General Purpose

Benefits

→ First solution that significantly lowers the cost for PCI-based NICAM & Dual FM TV cards
→ Optimizes video editing, compression, and recording, e.g. time-shift viewing
→ Captured mono audio (from tuner or stereo mono line-in) signals can be directly forwarded via loop-back cable to sound card to support legacy analog audio

→ Outstanding video performance and signal-to-noise ratio (SNR)
→ Best-in-class luma/chroma separation and bandwidth for easier programming
→ Enables content protection and low-cost time-shift applications
→ Reduces board space, system costs, and external components
→ Glueless MPEG encoder interface without sample rate converter, clock generator or PLL

→ Enables low-cost PCI-based digital TV and DVB applications
→ Reduces chip count for hybrid analog/digital broadcast designs
→ Enables hardware MPEG encoding for low-cost

SAA7134 Typical PC Application

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PHILIPS SEMICONDUCTORS’ SAA7134 PCI 9-BIT VIDEO/Stereo Decoder is the newest addition to the PCI 9-Bit Video Audio Decoder family, and is the world’s first solution that integrates stereo decoding and 9-bit video decoding on a single chip. An enhanced version of the original SAA7130 Video Decoder (the two chips are pin-for-pin compatible), the SAA7134 supports TV-sound decoding, including NICAM and Dual FM systems (found in Europe and Asia), featuring low-noise analog-to-digital converters, an adaptive four-line comb filter, and best-in-class oversampling, the SAA7134 provides the best PAL, NTSC, and SECAM performance in the PC industry.

**PRODUCT HIGHLIGHTS**

- SAA7134 digitizes and decodes video and stereo signals and bus-masters them over the PCI bus, providing the industry’s most advanced features in a unique, integrated package.
- Complete worldwide PAL/NTSC/SECAM decoding with full auto detection
- Multi-standard NICAM and Dual FM hardware stereo decoding
- Adaptive 4-line comb filter for PAL and NTSC
- Comprehensive three-level Hardware Macrovision® Detection Certification (as required for time-shift applications), with active status interrupts
- Advanced up/down 3-D scaler with interpolation filters and video FIFO
- Direct VBI/COFDM/QAM support via dedicated “sidecar” output for hybrid analog/digital broadcast designs
- PCI-bus mastering of video, VBI, and sound data
- Stereo-audio DAC for analog loop-back cable to soundcard
- Digital-audio output and input in I2S format
- Superior Pixel Accurate Scaling
- Integrates VBI-data support for Teletext, Intercast, Closed Caption, etc.
- Windows compliant sub-vendor ID support
- Stereo-audio A/D converter for digitizing microphone input (no external AD converter)
- Pin-to-pin compatible with the SAA7130
- ACPI-compliant power management

**APPLICATIONS**

The SAA7134 provides low-cost, high-quality decoding, flexible scaling, and transport-stream processing for PC/audio/video applications.

- PC stereo TV analog receiver cards
- PC TV hybrid analog/digital (DVB/ATSC) receiver cards
- PC-DVB (satellite, terrestrial, cable) receiver cards
- VBI-data services capture (closed caption, Teletext, WST, NABST, CGMS, WSS, and more)
- Surveillance applications (multi-board configurations)
- PC-based digital VCRs
- Digital video output, ITU, VIP, VMI formats
- General purpose I/O, e.g. for “strapping” and interrupt propagation
- Propagate RESET and ACPI state D3 to peripheral interfaces
- Microphone input (no external AD converter)
- Audio enhancements (e.g. virtual surround sound)
- Direct VSB/COFDM/QAM support via PCI video decoder with mono sound
- Complete worldwide PAL/NTSC/SECAM decoding
- Advanced up/down 3-D scaler with interpolation filters and video FIFO
- Digital-audio output and input in I2S format
- Superior Pixel Accurate Scaling
- Integrates VBI-data support for Teletext, Intercast, Closed Caption, etc.
- Windows compliant sub-vendor ID support
- Stereo-audio A/D converter for digitizing microphone input (no external AD converter)
- Pin-to-pin compatible with the SAA7130
- ACPI-compliant power management

**Additional Features**

The SAA7134 provides flexibility for easy, cost-effective design for today’s audio/video applications.

- Packaged in 128-pin QFP
- 3.3 Volt power supply
- 1 watt power consumption (typical)
- Windows ACPI power-down mode
- All interface signals 5 Volt tolerant
- Reference design available
- Complete SDK for Windows 95/98, -NT, -2000 operating system and device sets for VFW & WDM environments
- Peripherals Interface
- PC card interface, 3.3- and 5 Volt compatible
- Digital-audio output and input in I2S format
- General purpose I/O, e.g. for “strapping” and interrupt propagation
- Propagate RESET and ACPI state D3 to peripheral interfaces

**Integrated Stereo And Video Decoding**

The SAA7134 is perfect for analog TV and sound capture in the PC, as well as for digital-video broadcast. Analog video is digitized by a sophisticated 9-bit frontend, including built-in clamping and gain control, followed by an adaptive multi-standard 4-line comb filter for high performance luma/chroma separation. As required by the application, the video stream can be scaled in horizontal and vertical directions, and by field rate. TV-stereo sound is decoded from sound IF (SI) or NICAM and Dual FM systems (analog sound is digitized). The digital audio stream can be captured through dedicated DMA into PCI memory space, or output in F5 format to further peripheral digital sound processing, e.g. virtual surround sound, or converted to analog stereo via integrated audio DACs, to feed analog audio over loop-back cable to the sound card function.

The SAA7134 provides a versatile peripheral interface to support system extensions (e.g. MPEG encoding for time-shift viewing), or DSP applications for audio enhancements (e.g. virtual surround sound). The channel decoder for digital-video broadcast reception (ATSC, DVB) can re-use the integrated video ADCs. The transport stream (from a DTV/DVB channel decoder) can be processed through the peripheral interface.

**PC Holder**

- Integrated Stereo And Video Decoding
- High-performance luma/chroma separation
- Adaptive multi-standard 4-line comb filter
- 9-bit digital video output
- Digital-audio output and input in I2S format
- Superior Pixel Accurate Scaling
- Integrates VBI-data support for Teletext, Intercast, Closed Caption, etc.
- Windows compliant sub-vendor ID support
- Stereo-audio A/D converter for digitizing microphone input (no external AD converter)
- Pin-to-pin compatible with the SAA7130
- ACPI-compliant power management

**Applications**

- Mobile applications (ACPI compliant)
- Hybrid analog/digital multimedia set-top boxes
- Surveillance applications
- PC-DVB (satellite, terrestrial, cable)
- PC TV hybrid analog/digital (DVB/ATSC)
- PC stereo TV analog receiver cards
- Complete worldwide PAL/NTSC/SECAM decoding
- Adaptive 4-line comb filter for PAL and NTSC
- Comprehensive three-level Hardware Macrovision® Detection Certification (as required for time-shift applications), with active status interrupts
- Advanced up/down 3-D scaler with interpolation filters and video FIFO
- Direct VBI/COFDM/QAM support via dedicated “sidecar” output for hybrid analog/digital broadcast designs
- PCI-bus mastering of video, VBI, and sound data
- Stereo-audio DAC for analog loop-back cable to soundcard
- Digital-audio output and input in I2S format
- Superior Pixel Accurate Scaling
- Integrates VBI-data support for Teletext, Intercast, Closed Caption, etc.
- Windows compliant sub-vendor ID support
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- PC TV hybrid analog/digital (DVB/ATSC) receiver cards
- PC DVB (satellite, terrestrial, cable) receiver cards
- VBI-data services capture (closed caption, Teletext, WSS, NABST, CGMS, WSS, and more)
- Surveillance applications (multi-board configurations)
- PC-based digital VRs
- WebTV for Windows
- Hybrid analog/digital multimedia set-top-boxes
- Mobile applications (ACPI complaint)

**PRODUCT HIGHLIGHTS**

- Complete worldwide PAL/NTSC/SECAM decoding with full auto detection
- Multi-standard NICAM and Dual FM hardware stereo decoding
- Adaptive 4-line comb filter for PAL and NTSC
- Comprehensive three-level hardware Macrovision® Detection Certification (as required for time-shift applications) with active status interrupts
- Advanced up/down 3-D scaler with interpolation filters and video FIFO
- Dedicated VBI/COFDM/QAM support via dedicated “sidecar” output for hybrid analog/digital broadcast designs
- PCI-bus mastering of video, VBI, and sound data
- Stereo-audio, PCM for analog loop-back cable to soundcard
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Analog video is digitized by a sophisticated 9-bit frontend, including built-in clamping and gain control, followed by an adaptive multi-standard 4-line comb filter for high performance luma/chroma separation. As required by the application, the video stream can be scaled in horizontal and vertical directions, and by field rate. TV stereo sound is decoded from sound I/F (SIF) for NICAM and Dual FM systems (analog TV sound is digitized). The digital audio stream can be captured through dedicated DMA into PCI memory space, or output in F5 format to further peripheral digital sound processing, e.g. virtual surround sound, or converted to analog stereo via integrated audio DACs, to feed analog audio over loop-back cable to the sound card function.

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- Windows ACPI power-down mode
- **All interface signals 5 Volt tolerant**
- Reference design available
- Complete SDK for Windows 95/98, -NT, -2000 operating system and driver sets for VFW & WDM environments
- **Peripheral Interface**
  - PCI master interface, 32- and 33 MHz
  - Digital-video output, ITU, VPI, VMI formats
  - Digital-audio output and input in F5 format
  - Transport-Stream input, serial or parallel
- **General purpose I/O, e.g. for “strapping” and interrupt**
- Propagate RESET and ACPI state D3 to peripheral

**APPLICATIONS**

- Surveillance applications (multi-board configurations)
- TV sound is digitized). The digital audio stream can be captured from sound IF (SIF) for NICAM and Dual FM systems (analog TV sound is digitized). The digital audio stream can be captured through dedicated DMA into PCI memory space, or output in F5 format to further peripheral digital sound processing, e.g. virtual surround sound, or converted to analog stereo via integrated audio DACs, to feed analog audio over loop-back cable to the sound card function.

The SAA7134 provides the best PAL, NTSC, and SECAM performance in the PC industry.
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SAA7134 Typical PC Application