



NXP PCI Express dual-channel,  
combo (ATSC/NTSC) PC TV  
reference design, PCV500/DA

## Dual-channel (combo or dual-analog) PC TV capture card for desktop PCs

The highly integrated PCV500/DA reference design lets manufacturers tailor tuning performance of dual-channel PC TV capture cards to suit cost and selectivity requirements.

### Key features

- Simultaneous combo (analog/digital) or dual-analog TV reception for desktop PCs
- Receives digital cable TV (ATSC/Clear QAM), analog TV (NTSC), FM radio in North America and other ATSC/NTSC markets
- Can or silicon tuner for one analog channel
- Many watch/record viewing combinations
- Captures baseband A/V from CE devices

### Features NXP SAA7164 PC TV IC

- Dual-channel analog TV video and sound decoding
- High-quality MPEG-2/4 AV encoding for DVR, time-shift and archive (with host PC)
- Multi-level content protection
- Motion adaptive 3D comb filters and 3D noise reduction on both channels

The PCV500/DA reference design features simultaneous TV reception and stream processing of two, independent signals: one analog plus one digital or two analog. Complete functionality includes analog tuning, digital tuning and channel decoding, FM radio reception, baseband A/V capture, analog TV A/V decoding and high-quality MPEG-2 encoding (to support recording features with host PC).

The PCV500/DA's flexible design enables consumers to enjoy many watch, record, and surfing feature combinations such as:

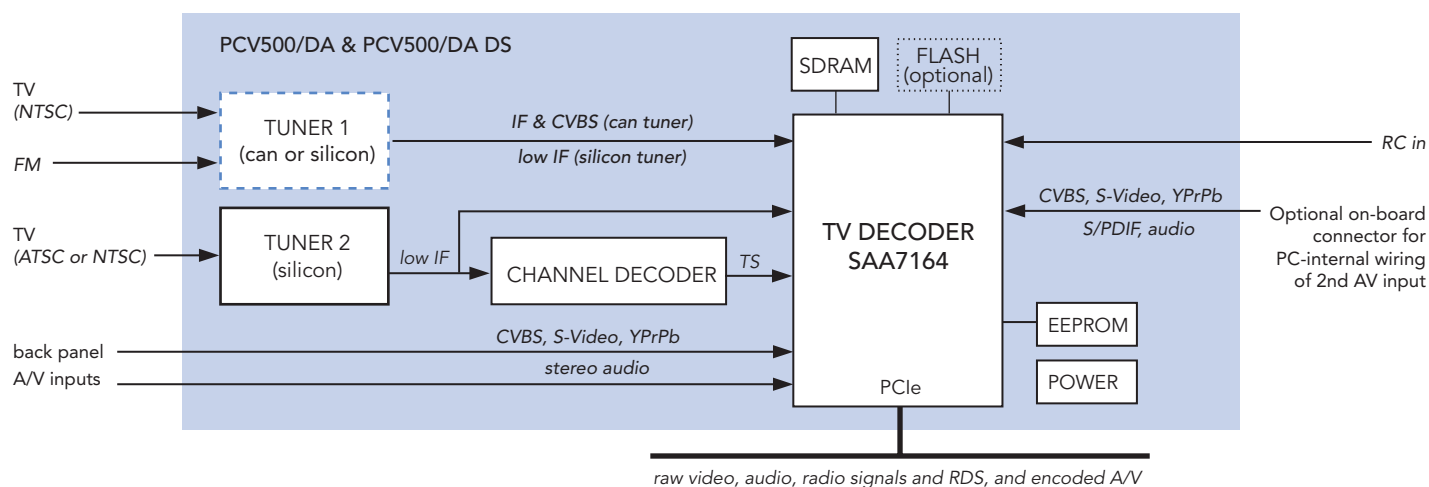
- Picture-in-Picture, split screen, and watch/search
- record one digital TV program and listen to radio or watch an analog TV program
- record an analog TV program and watch a digital or second analog TV program
- and more.

### Tuning options

Two PCV500/DA configurations lets manufacturers match tuning performance with price point for one analog channel: a silicon tuner offers low cost and a small board footprint, or a can tuner delivers exceptional performance in areas of problematic reception. Digital reception is handled through a separate silicon tuner.

### Exceptional integration, lowest BOM

The PCV500/DA's exceptionally high integration is due in large part to the robust functionality of the SAA7164 IC. In addition to demodulating and decoding two independent channels of broadcast analog TV video and stereo and encoding AV for recording, the SAA7164 performs advanced filtering and dynamic echo cancellation to ensure high-quality reception under the most demanding conditions.



Other SAA7164 features include picture enhancements, high-quality scaling, vertical blanking interval extraction, remote control support for TV and recording, multi-layer content protection (Macrovision®), and CGMS-A extraction.

The PCV500/DA is supported on popular Windows operating systems and third-party TV/DVR applications. Board setup and control are handled through the Windows WDM driver AVStream Class with BDA Extensions.

All configurations include a full-profile PCIe reference card, all necessary drivers, a user manual, schematics, a BOM, Gerber files, and documentation. Board designs are easily converted to dual-silicon tuner PCIe low-profile form factors.

## Specifications

### Reception

- Channel 1: analog TV (NTSC), FM radio
- Channel 2: analog TV (NTSC) or digital TV (ATSC, ClearQAM (64 QAM and 256 QAM/QAM ITU-TJ83 Annex B))
- Two baseband inputs: video (CVBS, S-Video, or YPrPb) and stereo audio

### Main reference board configurations

- PCIe host bus interface; full-profile form factor
- Separate RF connectors for digital cable TV, analog TV, and FM radio
- Tuner options
  - PCV500/DA: NXP FM1236 Mk5 can tuner (NTSC); NXP TDA18271HD silicon tuner (NTSC, ATSC/ClearQAM)
  - PCV500/DA DS: 2 NXP TDA18271HD silicon tuners (NTSC, ATSC/ClearQAM)
- Samsung S5H1409 channel decoder (ATSC/QAM)
- NXP SAA7164 PC TV capture/encode IC
- 32-MB DDR RAM
- 3 switched supply regulators
- EEPROM (board configuration)
- 4-MB Flash memory footprint; Flash memory (ST M25P32) optional
- (optional) 1 external IR transmitter

### SAA7164 PC TV capture/encode IC

- Two independent channels
- Worldwide analog TV video decoding: NTSC M, NTSC Japan, NTSC 4.43, PAL BGDHIN, PAL M, Combination PAL N, SECAM L/L'
- Worldwide analog TV sound decoding: BTSC with dbx™ noise, reduction, SAP, EIAJ, NICAM, FM A2, FM radio
- A/V encode: MPEG-1/2/4, WMV, DivX, and AAC-LC
- Audio formats MP3, MPEG1L2, Dolby Digital® (2-channel)
- Worldwide VBI text and data services
- 3D comb filter, 2D/3D noise reduction
- Processes CVBS, S-Video, component

### Operating system support

- Windows Vista
- WindowsXP® with application software (CyberLink, etc.) (not included)
- Windows MediaCenter Edition® 2005

### Certifications

- RoHS compliant

Use of this product in any manner that complies with the MPEG-2 Standard is expressly prohibited without a license under applicable patents in the MPEG-2 patent portfolio, which license is available from MPEG LA, L.L.C., 250 Steele Street, Suite 300, Denver, CO 80206.

www.nxp.com

founded by

**PHILIPS**

© 2007 NXP B.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: December 2007

Document order number: 9397 750 16207

Printed in the USA