NXP PCI Express single-channel PC TV capture/encode IC, SAA7163E

Cost-effective, multi-standard analog/digital PC TV engine

The PCI Express single-channel PC TV capture/encode IC, SAA7163E is a highly integrated solution for bringing popular hybrid TV reception and popular recording features to PCs.

Key features

- Single-channel design enables efficient watch and record in different formats, rates or resolutions
- Worldwide TV video/audio decoder supports current and legacy standards
- Supports a wide range of channel decoders: ATSC, DVB, ISDB and more
- Multi-standard digital video/audio encoder supports PVR, time-shift, and other recording features (with PC host)
- Multi-standard low-IF demodulation supports NXP silicon tuners
- Captures a transport stream (serial or parallel) from a digital TV demodulator
- Integrated RC receiver/transmitter
- Exceptional video quality achieved by adaptive 3D comb filter, 3D noise reduction, and subpixel-accurate scaling
- PCI Express X1 interface

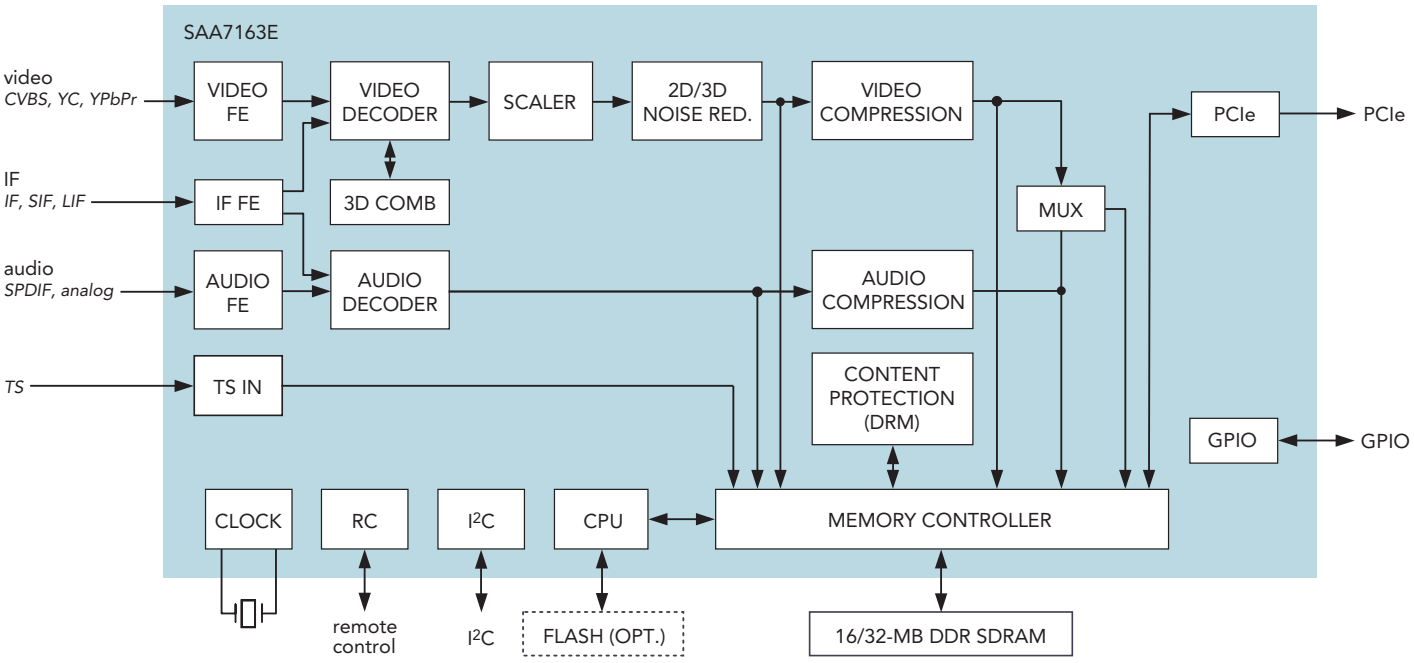
The SAA7163E demodulates and decodes analog TV (video and stereo audio) from innovative silicon tuners, high-performance can tuners and a variety of channel decoders. It captures worldwide digital TV broadcast standards enabling support for a variety of hybrid (analog/digital) receiver designs. A state-of-the-art video compression engine encodes the AV stream for features such as PVR, time shifting, and streaming media content to the PC or portable devices. Video and audio can also be captured from devices such as cameras, camcorders, and VCRs and recorded to HDDs, CDs, and DVDs.

The SAA7163 achieves exceptional picture quality through advanced features such as low-noise, high-quality ADCs, subpixel-accurate scaling, adaptive 3D comb filters and 3D noise reduction. Certified three-level Macrovision® detection circuitry ensures the video's original analog copy protection remains intact. Premium TV content is protected through 128-bit AES and (T)DES encryption. Vertical blanking interval (VBI) data slicing is supported for most worldwide standards. A PCI Express (PCIe) 1.1-compliant architecture ensures ample bandwidth for streaming features.

Software and reference designs

The SAA7163E has a high-level command and response interface (CRI). Broadcast driver achitecture (BDA) drivers and protected BDA (PBDA) drivers (included) use the CRI for plug-and-play applications. Reference designs are available for various combinations of analog and digital TV signal sources.

NXP founded by Philips



Specifications

Video/audio capture and decoding

- Worldwide analog TV SIF, IF, low-IF demodulation standards: M/N, B/G/H, D/K, I, L/L'
- Worldwide TV standards
  - PAL BGDHIN, PAL M, Combination PAL N, NTSC M, NTSC Japan, NTSC 4.43, SECAM
  - BTSC (optional dbx™ noise reduction), SAP, EIAJ, NICAM, FM A2, and AM
  - ATSC, DVB and ISDB transport streams
- Flexible video resolution
  - 70x64 up to 720x576 at 25 fps or 720x480 at 30 fps
  - D1 progressive (720x576 at 50 fps or 720x480 at 60 fps)
- FM radio with RDS
- Worldwide VBI text and data services
- Video from camcorders, VCRs, etc.: CVBS, SSIF, S-video (Y/C), YPbPr (RGB)
- Macrovision 1.0 copy protection detection
- Adaptive spatial and temporal 3D comb filter (NTSC/PAL)
- Advanced 3D noise filter
- Horizontal and vertical down scaling
- WM digital rights management

Digital video encoding

- H.263, MPEG-1, MPEG-2 (MP@ML), MPEG-4 (SP, ASP), DivX (V4, V5), XviD, VC-1 (SP, MP, AP), WMV
- Bit rates up to 15 Mbit/s, CBR/VBR
- Reverse telecine (3:2 pulldown)
- 128-bit AES or (T)DES video encryption
- Content management support

Stream output formats

- TS, PS (DVD, SVCD), AVI, MOV, MP4 and ASF container

Digital audio encoding

- Dolby AC-3®, MPEG 1 L2, MP3, AAC-LC, WMA
- Bitrates: 64 kbit/s up to 448 kbit/s

Interfaces

- Stereo baseband audio: three inputs, one output
- SPDIF: one single-ended input; one single-ended output
- One transport stream input: serial or parallel, 480p, 576p, 720p, 1080i
- Remote control: one IR receiver, one IR transmitter, all common TX standards
- Clock Xtal: main 54-MHz, secondary 24.576-MHz
- PCI Express Specification 1.1
- Three master and slave I²C bus ports
- One serial peripheral interface (SPI)
- Eight GPIO pins for general I/O or IRQs
- 16-bit width DDR SDRAM
- 90-nm CMOS BGA364

Date of release: February 2007
Document order number: 9397 750 15869
Printed in the USA