PCI A/V MPEG-2 Recorder/Player

Insta-Replay™ CS92210 PCI Reference Design

Description
The Insta-Replay™ CS92210 PCI Reference Design is a half-sized PCI card that makes it easy to capture and playback audio, video, and television signals on Microsoft Windows based personal computers equipped with PCI slots. The Insta-Replay design can output MPEG video to either the computer display or a standard NTSC/PAL video monitor. Typical Insta-Replay applications include:

- Audio/Video Capture/Playback
- Still Image Capture
- TV Watching
- TV Timeshifting
- VCD/SVCD/software DVD Playback
- VCD/SVCD/DVD Creation
- Video Editing
- Video Email
- Video Conferencing
- Video Surveillance
- Large screen presentations

The main hardware components of the Insta-Replay board are a NTSC/PAL TV/FM tuner, Philips SAA7121 NTSC/PAL video encoder, Philips SAA7114 video decoder, the CS92210 video codec, a Philips SAA7146A PCI bridge chip, an A/D Converter and D/A Converter to convert analog audio into digital audio, and digital audio into analog audio.

The NTSC/PAL video decoder and encoder interface gluelessly to the CS92210’s video port using ITU-R BT.601 and ITU-R BT.656 digital video data formats.

The CS92210’s host interface connects gluelessly to the Philips SAA7146A PCI port to enable real-time video overlay. The CS92210’s host interface connects gluelessly to the Philips SAA7146A PCI bridge’s data port for transferring MPEG-2 compressed video over the PCI bus.

The audio I/O subsystem features an A/D Converter and D/A Converter to convert analog audio into digital audio, and digital audio into analog audio.

Features
- Complete CS92210 based PCI reference design for MPEG-1 or MPEG-2 audio/video encoding/decoding
- Includes Hardware, Software, Firmware, Schematics, Gerbers, Layout, BOM files and documentation
- PCI bus master interface supports real-time video overlay during record and playback
- Complete AV solution with audio A/D Converters and D/A Converters
- NTSC and PAL Support
- NTSC and PAL output of MPEG-1 and MPEG-2 video enables use of large screen displays
- Computer display of MPEG-1 and MPEG-2 video (requires DVD decoder software and license)
- Composite and S-Video inputs and outputs
- Real-time two channel MPEG (Layer II) audio encoding/decoding
- Real-time MPEG-1 video encoding/decoding

- Real-time MPEG-2 ML @ MP video encoding/decoding
- Encodes using single pass variable bit rate (VBR) at up to 10Mbps
- Encodes constant bit rate (CBR) at up to 15 Mb/s (IBP frames) or up to 30 Mb/s for I-frames only
- Philips SAA7146A PCI Bridge
- Philips SAA7114 video decoder
- Philips SAA7121 video encoder
- Multi-channel, cable ready TV tuner covers the band range 55.25 MHz to 801.25 MHz
- Stereo-FM tuner covers the band range 76.0 MHz to 108 MHz
- MPEG audio compression (Layer II) using Qdesign iMedia MPEG Pro software (requires license)
- Software-based multiplexing and demultiplexing of audio/video bit streams
- Enables fast development of aggressively priced PCI-based TV tuner and video capture devices

System Block Diagram

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System Requirements
The minimum system requirements for the Insta-Replay CS92210 PCI Reference Design Kit are:

- Intel 350MHz Pentium II/AMD 450MHz K6-2
- Windows 98/98SE/ME
- 64MB minimum RAM
- 60MB free hard disk space (Time shifting applications will require significantly more space)
- Graphic accelerator with DirectDraw Overlay Support (AGP recommended)
- SVGA monitor (800x600)
- Half size PCI slot

Software Licenses
The Insta-Replay Reference Design Kit includes an evaluation software license for Qdesign. It is the manufacturers’ responsibility to contact Qdesign and acquire the appropriate number of OEM software licenses when manufacturing and selling products based on the Insta-Replay design. The following softcopy license agreements are located on the USB-TV SW Reference CD:

- Qdesign OEM License Agreement

Deliverables
- Insta-Replay PCI Board
- Insta-Replay HW Reference CD containing:
  - Schematics (Orcad)
  - Gerbers
  - Job/Layout Files (PADS)
  - Bill of Materials (MS Excel)
- Insta-Replay SW Reference CD containing
  - Windows 98 WDM Driver
  - C++ Demo Application
  - Demo Application Source Code
  - Release/Application Notes
  - Qdesign OEM License (PDF Format)
- Insta-Replay Technical Manual
- CS92210 Data Sheet
- Insta-Replay Quick Start Guide