

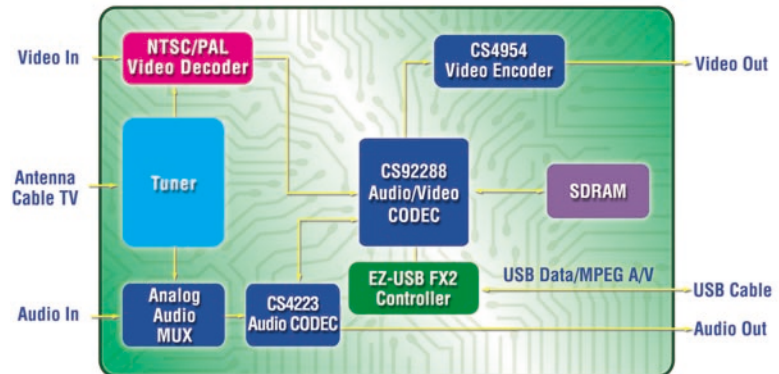
## USB-Based Digital Video Recorder/Player Reference Design Rapid Development of Award-Winning Digital Video Peripherals for PCs

### USB-DVR 2.0 Differentiators

- Award-winning design: CES 2003 Innovations Award – Design & Engineering Showcase Honors
- ADS Instant DVD 2.0, based on Cirrus Logic's USB-DVR 2.0 platform, received an August 2003 *PC Magazine* Editors' Choice Award
- WHQL certified Windows® driver software and USB-IF certified USB 2.0 hardware with logo
- CODEC architecture enables analog audio/video output to VCRs and televisions
- DV input and camcorder control using Divio DV daughter card option

### USB-DVR 2.0 Features

- USB 1.1 and 2.0 reference design for MPEG-1 or MPEG-2 audio/video encoding/decoding
- Supports USB 2.0 and 1.1
- Includes hardware, software, firmware, schematics, Gerbers, layout, BOM files and system manual
- 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 or MPEG-2 ML@MP video encoding/decoding
- Cypress® EZ-USB® FX2 Controller
- CS4954 NTSC/PAL Video Encoder and CS4223/4 audio CODEC from Cirrus Logic
- Supports the Philips SAA7714 (value) and SAA7115 (performance) video decoders
- Hardware-based audio/video multiplexing and demultiplexing for perfect A/V synchronization
- Enables fast development of aggressively priced USB-based digital video products



The USB DVR-2.0 reference design makes it easy to capture, edit, view, and store audio, video and television signals on Microsoft Windows®-based personal computers with USB ports. MPEG video can be displayed on a computer monitor or a standard NTSC/PAL video monitor. The cost-effective USB-DVR 2.0 design incorporates the CS92288 MPEG-2 Audio/Video CODEC, the CS4223/4 Audio CODEC, a video digitizer and SDRAM memory. Optional components include the CS4954 NTSC/PAL video encoder, an NTSC or PAL/SECAM Cable TV tuner, an audio mux and a DV daughter card.

The CS92288 MPEG-2 audio/video CODEC is the heart of the reference design. It's a single chip, real-time MPEG audio/video encoder/decoder featuring a programmable system mux/demux that encodes/decodes MPEG-1/2 compatible bitstreams with frame-accurate lip sync. In addition, the CS92288 is one of the few commercially available MPEG CODECs to implement both Field Mode and 16x8 (pixel) motion estimation coding. These advanced modes enable encoding of bitstreams of superior video quality over a wide range of bitrates from low (2-3b/s) to high (8-9b/s). An embedded audio DSP enables comprehensive format support including MPEG-1 Layer 1 (MP1), Layer 2 (MP2) and Layer 3 (MP3).

The USB-DVR 2.0's modular design enables rapid development of multiple PC products from a single hardware platform. The fixed form factor (size) design uses a single plastic case for all configurations, greatly reducing tool and die manufacturing costs. Now OEMs (Original Equipment Manufacturers) and ODMs (On-Demand Manufacturers) can quickly bring to market new DVD-focused PC products at mass-market price points.

## System Requirements

The minimum system requirements are:

- Intel 400 MHz Pentium® II/AMD 500MHz K6-2
- Windows 98SE/ME/XP/2000®
- 64 MB minimum RAM
- 60 MB free hard disk drive space (time shifting applications will require significantly more space)
- Graphic accelerator with MS-DirectDraw® overlay support (determined by DVD decoder software)
- SVGA monitor (800x600)
- USB 2.0 or 1.1 port (1.1 port will limit performance)
- Optional components: USB-Divio DV daughter card (CMK92288USB-DIVIO) for real-time DV-to-MPEG conversion and camcorder control

## Optional DV Daughter Card

The optional USB-Divio DV daughter card plugs directly onto the USB-DVR PCB using a standard 28-pin header and does not affect form factor. This feature enables DV functionality to be added as a factory option or as a field upgrade. With the addition of the DV daughter card, DV can be converted to MPEG in real-time and the camcorder can be directly controlled via the 1394 bus, enabling software control (and automation) of the entire editing and conversion process.

## Software Licenses

The USB-DVR Reference Design Kit includes a demo copy of an OEM DVD decoder software package. It is the customer's responsibility to acquire the appropriate number of software licenses for this bundled DVD decoder software to support the manufacturing and selling of products based on the USB-DVR 2.0 design.

## Deliverables

- USB-DVR 2.0 HW Module
  - 4-Layer PCB
  - Aluminum/Lucite casing
- USB Cable
- Power Supply
- USB-DVR 2.0 HW Reference CD containing:
  - Schematics (OrCAD)
  - Gerbers
  - Job/Layout Files (PADS)
  - Bill of Materials (MS Excel)
- USB-DVR 2.0 SW Reference CD containing:
  - Windows 98SE/ME/XP/2000® device drivers for x86-based systems
  - Demo Application
  - Demo Application Source Code (in C++)
  - Release/Application Notes
  - Demo copy of OEM DVD Decoder Software
  - Manufacturing Test Program
  - USB-DVR 2.0 System Manual
  - USB-DVR 2.0 Manufacturing Test Program Manual
    - CS92288 Data Book
    - CS92288 Programming Guide

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