DVxplore™ Codec – DVD-Quality Video Recording and Playback for Consumer PCs

DVxplore

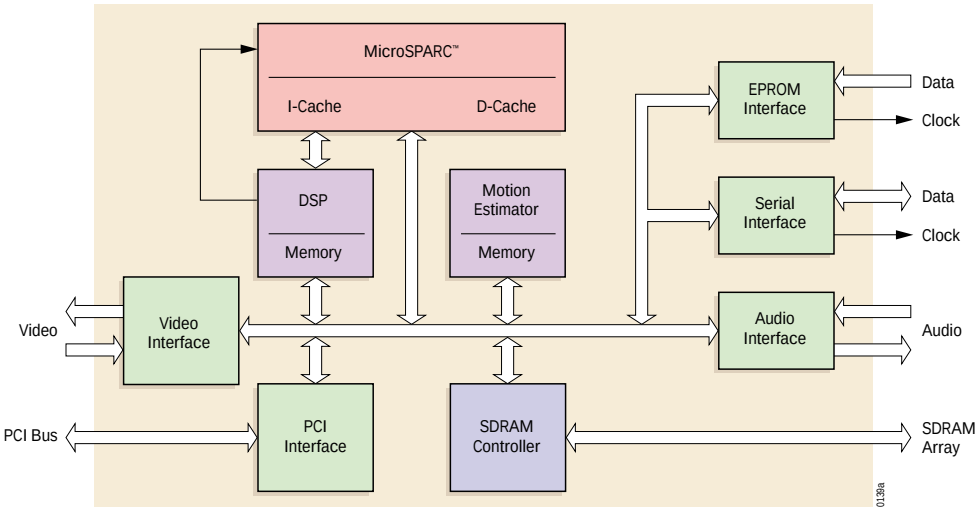
OVERVIEW

The DVxplore™ codec from LSI Logic is the industry's first single-chip MPEG-2 and DV consumer codec, delivering DVD-quality video recording and playback for consumer applications. The DVxplore codec enables exciting new content creation and PC/TV applications for the home, based on DVD-quality video recording.

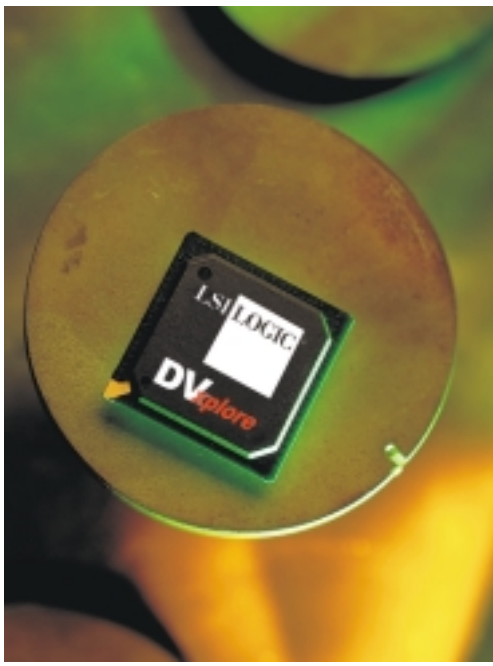
For the first time, PC manufacturers can offer consumers DVD-quality video recording and frame-accurate MPEG-2 editing, turning PCs into complete DVD-recording and content-creation stations. Manufacturers can incorporate sophisticated digital video recording features, such as automatic television program recording using an electronic program guide (EPG), into consumer PC/TV products.

Digital recorder applications can provide time-shifting capabilities such as instant replays of broadcast programs. As a result, manufacturers and applications developers can use the codec to establish DVD-quality (MPEG-2) video as a standard data type on consumer PC and PC/TV platforms.

The DVxplore codec leverages LSI Logic's highly flexible DVx video compression and decompression architecture to provide an unprecedented range of capabilities that aren't limited to a single video format. PC users can acquire video from analog, DV, or MPEG sources and edit it with frame accuracy to create MPEG-2 videos that play back on any MPEG-2 or DVD decoder. Employing MPEG-2 compression, users can extend recording time tenfold compared to Motion JPEG (M-JPEG) or DV solutions. They can also use the codec to address low-bandwidth applications such as MPEG-1 video for Web sites and e-mail.



DVxplore™ System Block Diagram



FEATURES:

- MPEG-2 encoding with integrated PerfectView® encoding algorithm
- Dual-stream MPEG-2 decoding
- Real-time DV to MPEG-2 transcoding
- DVD deocding: full decoding of CSS-encrypted MPEG-2 video and sub-picture streams
- MPEG-1 encoding
- Single-stream DV codec

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FEATURES (CONT'D):

With a DVxplore codec on board, PC/TV products have the power to deliver a wide range of video recording and interactive viewing options. For instance, viewers can:

- Automatically record TV shows by selecting items on an electronic program guide
- Rewind, pause, and fast-forward live broadcasts
- Simultaneously access the Internet and record or view a program
- Interact with broadcast TV programs

KEY FEATURES AND BENEFITS

DVD-Quality Video

The DVxplore codec delivers MPEG-2 video to consumer PCs, allowing full-screen DVD-quality video recording and playback at consumer prices. The codec runs downloadable microcode that lets it operate as both a DVD-quality digital video recorder (encoding) and player (decoding). LSI Logic's patented PerfectView encoding algorithm produces superior images using a number of techniques—including multilayer motion estimation, variable bit rate (VBR) encoding, inverse telecine, and optimal bit allocation—that work together to improve encoding efficiency and picture quality.

Consumer Video Editing

The DVxplore codec provides personal video content creators with 1-2-3 simplicity. Hardware acceleration for dual-stream decoding and video post-processing lets users perform seamless MPEG editing in real time using LSI Logic's revolutionary FAME™ (Frame Accurate MPEG Editing) technology. FAME allows users to implement special effects on the fly, and accomplish A/B roll transitions across frames such as fades and dissolves. Because the DVxplore codec records and edits the video in MPEG-2 format, all files can easily be stored on an ATAPI hard disk.

DV Video Capture and Transcoding

The DVxplore codec is a forward-looking solution that supports DV-format digital camcorders as well as conventional analog camcorders. This feature is especially desirable as consumers increasingly turn to digital video cameras and consumer PCs come equipped with an IEEE 1394 interface. The DV to MPEG-2 transcoding capability creates video files that are playable on any MPEG-2 or DVD decoder and saves disk space by increasing compression 5 to 10 times.

Internet-Ready Videos

DVxplore's encoding capability MPEG-1 videos that are perfect for low-bandwidth Internet and intranet applications. For example, users can go beyond banners and still photos to create video content for a Web site, including live "webcam" images. They can also use video e-mail software to add life to their mail attachments.

Extended Recording Time

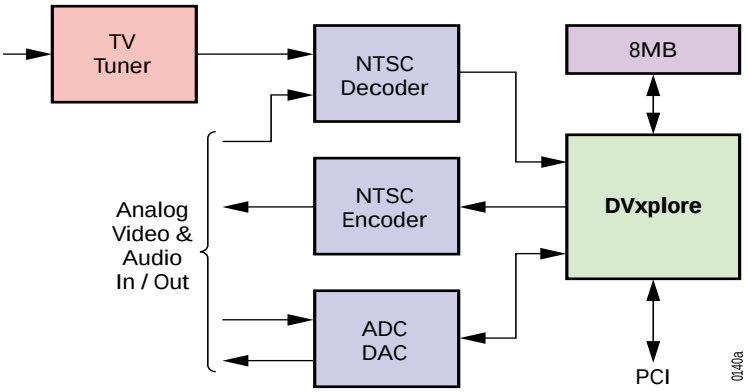
DVxplore VBR technology lets users record hours of DVD-quality video on DVD-RAM, PC hard disks, or other media. For example, users can store up to one hour of video per gigabyte of storage capacity. This makes high-quality video recording economical and practical on consumer PCs.

Convergence Technology for the Home

The DVxplore codec may be used in DVD-RAM bundles and upgrade kits that provide a complete content creation upgrade. In addition, PC and set-top hybrids will be able to offer DVD-quality video recording, authoring, and storage in one box.

Easy PC Integration

The DVxplore codec PCI bus interface allows easy integration with PCs. It takes advantage of bus mastering to minimize CPU utilization and maximize bus throughput. The codec also supports output of uncompressed video to a dedicated PC video port for display on the PC monitor. The highly compressed MPEG video streams (2 to 10 Mbps) created by the codec can easily be transferred to and from standard PC ATAPI hard disk drives, eliminating the need for expensive SCSI hard disk drives.



DVxplore™ System Block Diagram

Personal Content Creation with DVxplore™

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Specifications

Datarate Comparison

Mode	Video Rate (Mb/s)	Video Resolution	Audio Rate(kbps)	Total(MB/min)
MPEG-2 Extended Play	2	352x480	224	16.68
MPEG-2 Long Play	4	720x480	224	31.68
MPEG-2 Short Play	6	720x480	224	46.68
MPEG-1	1.15	352x240	192	10.07
DV25	25	720x480	768	193.26

Mode	Capacity (Minutes)		
	8 GB	CD/R	DVD
MPEG-2 Extended Play	360	39	156
MPEG-2 Long Play	189	21	82
MPEG-2 Short Play	29	14	56
MPEG-1	596	65	258
DV25	31	3	13

Video

Mode	MPEG-2	DV25	MPEG-1
Encoded Bit Rate Range	2 to 10 Mbps	25 Mbps	64 Kbps to 2 Mbps
GOP Options	I-only, I, B, P	I-only	I, B, P
Video Input Resolution	Horizontal 720, 352 Vertical NTSC 480, PAL 576	Horizontal 720 Vertical NTSC 480, PAL 576	Horizontal 352, 176 Vertical NTSC 240, 112, PAL 288, 144
Motion Search Ranges	Horizontal ±202 pels; Vertical ±62		Horizontal ±166 pels; Vertical ±70
Frame Rates	NTSC 29.97 Hz PAL 25 Hz Film 23.976 Hz	NTSC 29.97 Hz PAL 25 Hz N/A	NTSC 29.97 Hz PAL 25 Hz Film 23.976 Hz

Electrical

Mode	
Video I/O Interface	CCIR-656
Audio I/O Interface	Serial interfaces that connect to IDS (up to 8 channels)
Host Interface	PCI Rev. 2.1
Test Interface	IEEE 1149.1 (JTAG)
Input Voltage	3.3 V (5 V I/O Tolerance)
System Voltage	1.9 V
Power Consumption	2 W
System Clock	110 MHz
Package	308-pin BGA

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