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.

FEATURES:

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

DVxpl ore Codec – DVD-Quality Video Recording and Playback for Consumer PCs

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**
### Specifications

#### Datarate Comparison

<table>
<thead>
<tr>
<th>Mode</th>
<th>Video Rate (Mb/s)</th>
<th>Video Resolution</th>
<th>Audio Rate (kbps)</th>
<th>Total (MB/min)</th>
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</thead>
<tbody>
<tr>
<td>MPEG-2 Extended Play</td>
<td>2</td>
<td>352x480</td>
<td>224</td>
<td>16.68</td>
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<tr>
<td>MPEG-2 Long Play</td>
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<td>MPEG-2 Short Play</td>
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<tr>
<td>MPEG-1</td>
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<td>192</td>
<td>10.07</td>
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<td>DV25</td>
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<td>720x480</td>
<td>768</td>
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<table>
<thead>
<tr>
<th>Mode</th>
<th>Capacity (Minutes)</th>
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</thead>
<tbody>
<tr>
<td>8 GB CD/R DVD</td>
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<tr>
<td>MPEG-2 Extended Play</td>
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<td>MPEG-2 Long Play</td>
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<td>MPEG-2 Short Play</td>
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<td>MPEG-1</td>
<td>596</td>
</tr>
<tr>
<td>DV25</td>
<td>31</td>
</tr>
</tbody>
</table>

#### 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
- **Video Input Resolution**: Horizontal 720, 352, Vertical NTSC 480, PAL 576
- **Motion Search Ranges**: Horizontal ±202 pels; Vertical ±62
- **Frame Rates**: NTSC 29.97 Hz, PAL 25 Hz, Film 23.976 Hz

#### Electrical

- **Mode**: CCIR-656
- **Video I/O Interface**: Serial interfaces that connect to IDS (up to 8 channels)
- **Audio I/O Interface**: PCI Rev. 2.1
- **Host 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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