



# VIPeR f/x<sup>TM</sup>

Advanced Video Image Processor  
Data Sheet

GRAPHICS BY  
**TSENG**  
LABS

■ 9006165 0000093 575 ■

/

# VIPeR f/x Features

- ◆ Single 160-pin Quad Flat Pack application specific integrated circuit.
- ◆ Pin-compatible to Tseng Labs' VIPeR™ 1.0.
- ◆ Real-time dynamic enlargement and reduction of motion data streams using a proprietary imaging algorithm from 16x16 to 1024x800 pixels.
- ◆ Smooth scaling is performed in both X (horizontal) and Y (vertical) directions.
- ◆ Interfaces to ISA/EISA/MCA as well as VESA VL-Bus and Intel PCI architecture through Tseng Labs IMA protocol.
- ◆ Compression port allows external simultaneous hardware compression of video data stream.
- ◆ Accepts input data in 15/16-bit and 24-bit RGB as well as 4:4:4 and sub-sampled 4:2:2 and 4:1:1 YUV formats.
- ◆ Outputs 8-bit, 15/16-bit, and 24-bit RGB; ideal for Microsoft Windows and other personal computer graphics environments.
- ◆ IMA/VIPeR architecture creates a single frame buffer that includes both graphics display and motion video display data.
- ◆ Accepts either live input or stored/decompressed digital data from the host bus.
- ◆ Selectable refresh rate: 30 frames/second, 60 fields/second, or 30 fields/second.
- ◆ Digitization resolution: up to 1280x480 (580 for PAL) by 24-bit (dynamic).
- ◆ Screen resolution from 16x16 (icon) to 1024x800 by 8/15/16/24-bits of color.
- ◆ High-quality still frame and motion video capture.
- ◆ Selectable display of video: odd/even, odd only, or even only.
- ◆ Handles scan conversion from interlaced broadcast standards to high-refresh non-interlaced.
- ◆ Requires no external VRAM or DRAM for digitization.
- ◆ Supports hardware cropping.
- ◆ Internal video clipping control.
- ◆ External mask RAM support for video titling applications.

■ 9006165 0000094 401 ■

- ◆ Read/Write register control, memory mapped.

- ◆ Compatible with Microsoft Windows™ and Video for Windows™, IBM OS/2™, and YUV based compression such as Intel Indeo™ software Supermatch Cinepak™ and others.

## Product Overview

VIPeR f/x provides the hardware assist required by video software applications, game applications, Microsoft Windows, Windows '95, IBM OS/2 and others. VIPeR f/x excels in video applications, such as playing motion video files, enlarging or reducing MPEG movies and games, capturing real time video, or viewing broadcast TV in a window. The VIPeR accepts either RGB or YUV data.

### Enhancing Software Video Playback

Graphical user interface (GUI) users expect high-resolution display modes as well as the ability to display enlarged video windows with a high quality image. Today's CPUs, however, do not have adequate processing power to interpolate the video into a larger video display. During video playback, the CPU spends 65% of its time calculating color space conversion from YUV to RGB data types and stretch block transfer (Stretch BLT). By processing these functions, the VIPeR f/x frees the CPU's bandwidth for other applications while creating larger, lifelike images from typical 160x120, 15 to 30 frame per second (fps) CPU decompressed video - without reducing the frame rate of the motion video stream.

### Video in the home

The home market for personal computers is estimated to account for 50% of all units sold in the US, and 35% of all units sold in Europe. Most home computers are used for entertainment and education, as well as information processing. VIPeR f/x technology is ideal for displaying TV on the personal computer, capturing digital video, and accelerating video in games, education, and simulation software. In fact, the VIPeR f/x provides better high resolution, fully digital television. In addition, the high quality pixel interpolation and extrapolation in the VIPeR f/x engine is powerful enough to add value to MPEG hardware. MPEG output, rescaled by VIPeR technology exceeds the quality of broadcast video. OEM systems that employ Tseng's multimedia technology deliver a cost-effective solution to consumer markets while providing enough power for business and industrial use.

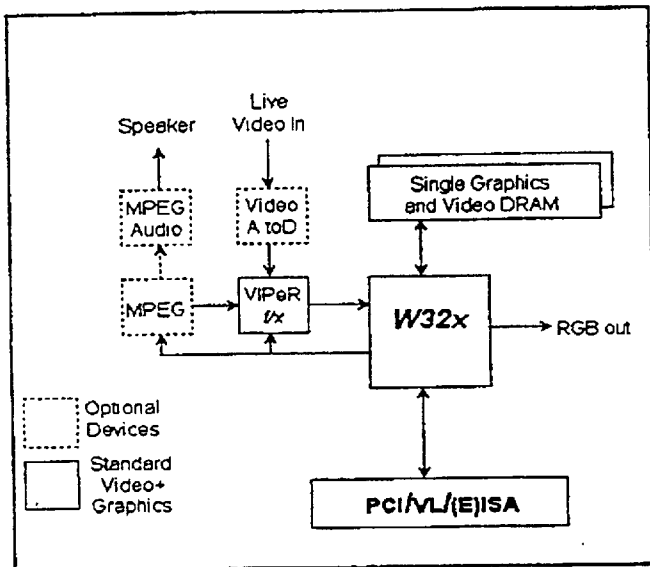
### Teleconferencing

Many of today's teleconferencing solutions compress video on the host PC and decompress the video on the receiving end with a CPU-based algorithm like Indeo. With VIPeR f/x in the system, the original data stream, which is likely to be 80x60 or 160x120 pixels, can be enlarged to any arbitrary size without adding

jagged edges or artifacts to the image. In addition, background application performance is not affected since the VIPeR handles all the resizing without CPU assistance. As a result, teleconferencing users can continue to work, pass data to each other, and update files more easily.

### Multimedia Building Block Approach

The VIPeR video processor combines with any member of the Tseng Labs W32 family of graphics accelerators as well as newer and more powerful chips to create complete multimedia video solutions. The VIPeR //x communicates with the graphics controller through a flexible protocol known as IMA™. The IMA architecture allows a number of multimedia peripherals to exist on a mezzanine bus dedicated to video. All multimedia devices communicate through the graphics accelerator's address space, allowing one single load to the PCI, VL-Bus, or ISA. System designers have the flexibility to add devices as needed to meet their customers' design and cost requirements.



## Software Support

Tseng Labs provides OEMs with the driver software necessary to build a video solution. Among these are:

**DCI video playback acceleration** - Microsoft Video for Windows™ and Apple Computer's Quicktime for Windows™ use a service provider known as DCI for both playback acceleration and on-screen formatting of data. Tseng Labs provides OEM customers with a DCI link driver for the VIPeR //x.

**Microsoft VIDCAP driver.** Tseng Labs VIDCAP driver is fully DCI compliant and is compatible with Microsoft Video for Windows VIDCAP program, Adobe Adobecap™ and Premier™, ULead Systems Video Studio™, Lenel Systems Media Recorder™, and

Splice, Inc's, Splice!™, as well as any motion video capture application that supports Microsoft's VIDCAP interface.

**VIMGCAPT.EXE.** This sample application is provided at no charge to customers to enable display and still frame capture of video under Windows.

Tseng Labs is continuously developing and adding software support for its multimedia solutions. For more information on software, please contact your Tseng Labs sales representative.

## Hardware Designs

The VIPeR //x is designed to fit onto the pad of existing designs for the Tseng Labs VIPeR Video Image Processor. A number of generic reference designs are available to OEMs for PCI, VL-Bus, and ISA peripherals. Additionally, custom design assistance can be provided for extended multimedia solutions that include IMA compression or decompression devices. Tseng Labs designs products for both a single PC board, or a board with a 50-pin IMA connector bus for future expansion. Please contact your Tseng Labs sales representative for a complete list of generic design schematics.

## VIPeR Family Comparison

	VIPeR	VIPeR //x
Dynamic Enlarge/Reduce	X	X
Horizontal and Vertical Interpolation	X	X
30 fps video capture	X	X
Video Input Format		
YUV4:4:4	X	X
YUV4:2:2	X	X
YUV4:1:1		X
RGB 24	X	X
RGB 16	X	X
Video Output Format		
RGB 24	X	X
RGB 16	X	X
RGB 8		X
Single Frame Buffer For Video Graphics	X	X
Maximum resolution (24-bit)	800x600	1024x768
Supports Mask RAM	X	X
Internal Windows Clipping Support		X
Multiple VIPeRs on single IMA card		X
Audio Channel Support	X	
De-Interlace mode		X



TM

**TSENG LABS, Inc.**  
6 Terry Drive  
Newtown, PA 18940  
(215) 968-0502

## VIPeR *f/x*<sup>TM</sup> Features & Benefits

- \* **Real-time dynamic enlargement and reduction of motion video streams.**
  - Quality enlargements of Cinepak<sup>TM</sup> and Indeo<sup>TM</sup> video without absorbing CPU bandwidth or dropping frame rate
  - Scale MPEG movies and games from fixed window size to full screen
  - Enlarge video-conferencing windows with no decrease in frame rate
- \* **Smooth scaling of video in both X (Horizontal) and Y (Vertical) directions.**
  - Proprietary scaling algorithm removes jagged edges in enlargements, eliminates need for pixel decimation in reductions
  - Drag open a video window of any size between 16x16 and 1024x768
  - Supports Intel / Microsoft DCI compatible software-only video, including MPEG, Motion JPEG, Indeo and Cinepak.
- \* **Real-time capture and display of 30 frames-per-second video.**
  - "TV in a Window" with optional TV tuner
  - Capture video clips from VCR for multimedia presentations
  - Enhanced synch separation allows fast-forward, reverse, freeze-frame display
  - Video capture and smooth scaling for desktop video-conferencing applications
- \* **Screen resolution from 16x16 (icon) to 1024x768 in 24-bit Truecolor.**
- \* **Accepts RGB and YUV 4:1:1, 4:2:2 and 4:4:4 data streams.**
  - Performs YUV -> RGB color space conversion for faster playback of CD-ROM based video
  - YUV 4:1:1 processing accelerates playback of Intel Indeo video titles
  - Saves valuable CPU bandwidth for use with other applications
- \* **Gamma Boost feature**
  - Richer colors when playing motion video clips such as Indeo and MPEG
- \* **Interfaces to ISA/EISA/MCA as well as VESA VL-bus and Intel PCI bus.**

4

■ 9006165 0000096 284 ■

- Single card video capture and acceleration possible at an SVGA price
- MPEG video playback scaled to full screen at 30 frames per second on a single, PCI compliant card
- \* **Single frame buffer architecture includes both graphics and video data.**
  - Tseng Labs' W32p graphics accelerator controls low cost DRAM buffer
  - Mix graphics and video data on a pixel by pixel basis for custom video window sizes and overlaying graphics on top of video
  - Great performance for much less than VRAM or dual frame buffer solutions
- \* **High quality still frame capture.**
  - Bullet-proof synch technology provides enhanced separation and quality stills
- \* **Compatible with popular third party multimedia editing packages**
  - Capture live video and stills, edit to include special effects, and store as Windows compatible .AVI file
  - Tested applications include Ulead Systems' *Media Studio*, Adobe *Premiere*, Lenel Systems' *Media Recorder*, and *Splice* from Asymetrix, Inc.
- \* **160 pin PQFP package compatible with existing VIPeR designs**
- \* **Compatible with Microsoft Windows™ and Video for Windows, IBM OS/2™, and YUV based compression such as Intel Indeo™.**

**Add-in boards using VIPeR technology are available from the following suppliers:**

**Jazz Multimedia**  
**JAKARTA**  
 (408) 727-8900

**Matrox**  
**Marvel II**  
 1(800) 361-4903

**miro Computer Products**  
**miroCRYSTAL TD Series**  
 (415) 855-0940

**SPEA**  
**Showtime Plus**  
 011 (498) 151 2661

**Imagraph**  
**IMASCAN**  
 (508) 256-4624

**Triumph Logistic Computers**  
**Visual Forge V-50**  
 (818) 858-5700

**Compumedia**  
**All Media Family**  
 011 (972) 3-691 6245

**Hercules Computer Products**  
**Power Playback Series**  
 1 (800) 532-0600

5