S3 Incorporated

Product Overview

S3 Trio64V+

Integrated Graphics/Video Accelerator

High-Performance Integrated Graphics/Video Accelerator

- High-performance DRAM-based 64-bit graphics engine
- Integrated 24-bit RAMDAC and programmable dual-clock synthesizer with 135 MHz output pixel rate
- Unique S3 Streams Processor for hardware-assisted video playback
- S3 Scenic Highway for direct interface to live video and MPEG-1 peripherals

S3 Trio64-compatible Mode Option

S3 Streams Processor Features

- Supports on-the-fly stretching and blending of primary RGB stream and RGB or YUV (video) secondary stream
- Each stream can have different color depths
- YUV data is color space converted

Advanced Playback Capabilities

- High-quality hardware-assisted video playback (up to 1024x768x16 bits/pixel)
- Support for Indeo, Cinepak, and software-accelerated MPEG-1 video playback

Game and Presentation Effects.

- Hardware double-buffering support for high-quality tear-free playback
- 2-D scrolling and sprite plane support
- Color and chroma keying for overlaying of graphics onto video and video onto graphics
- Arithmetic blending of two pixel streams for fade-in/fade-out transition effects

S3 Scenic Highway Interface

- Philips SAA7110/SAA7111 video digitizers
- S3 Scenic/MX2 MPEG-1 audio/video decoder, C-Cube CL-480 MPEG-1 decoder

High Non-Interlaced Screen Resolution Support

- 1280x1024x256 colors at 75 Hz refresh
- 1024x768x64K colors at 75 Hz refresh
- 800x600x16.7M colors at 75 Hz refresh

High-Performance Memory Interface

- 64-bit DRAM memory interface
- Supports 1-, 2-, or 4-MByte frame buffer
- Supports standard fast page mode and EDO DRAMs (60 MHz) and 1-cycle EDO DRAMs (50 MHz)

Supports CPUs with Big or Little Endian Byte Ordering

Industry-Standard Local Bus Support

- Glueless PCI bus support (fully compliant with Revision 2.0)
- Glueless VESA® VL-Bus support

Multimedia Support Hooks

- Glueless 16-bit VESA Advanced Feature Connector (VAFC)
- 8-bit bidirectional feature connector
- S3 Scenic Highway
- I^2C bus

Full Software Support

- Drivers for Windows® 3.11, Windows® NT, Windows® 95, OS/2® 2.1 and 3.0 (Warp™), SCO® UNIX®

Green PC/Monitor Plug and Play Support

- Full hardware and BIOS support for VESA Display Power Management Signaling (DPMS) monitor power savings modes
- DDC monitor communications support

Extensive Static/Dynamic Power Management

Industry-Standard 208-pin PQFP package

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Printed in USA 2/96
PO022-D

Overview

The S3® Trio64V+™ integrated graphics/video accelerator (hereinafter referred to as the Trio64V+) combines high-performance graphics and high-quality video acceleration features with the capability to directly interface to live video and MPEG-1 peripherals. It incorporates an enhanced version of the 64-bit graphics accelerator core and high-performance 135 MHz true-color RAMDAC that are found in S3's existing Trio64™ accelerators. All display applications that require high-quality video playback (from a CD-ROM or hard drive), or live video input capability, can take advantage of the Trio64V+'s new features. The Trio64V+ accelerates/ enhances software MPEG-1/Indeo/Cinepak video playback by providing arbitrary scaling with high-quality linear interpolation and color space conversion (RGB to YUV). By performing these tasks in hardware and relieving the CPU of a substantial overhead, the Trio64V+ offers high-quality video playback with window sizes of up to 1024x768x16 bits/pixel at high frame rates. The Trio64V+ has an S3 Scenic Highway™ interface that provides a direct interface to MPEG-1 audio/video decoder devices and live video digitizers to attain full-motion video.

S3 Streams Processor

The S3 Streams Processor™ allows the mixing of three separate display streams. The primary stream can be RGB data of any color depth. The secondary stream can be RGB or YUV (video) data of any color depth. YUV data is color space converted to RGB. The third stream, the hardware cursor, overlays the other two streams.

Arithmetic blending of a primary graphics stream and secondary graphics/video enables dramatic transition effects for game applications. Color and chroma keying allow opaque or transparent overlays of one stream on the other. Hardware-assisted double buffering of both primary and secondary data streams is also provided to enable high-quality "tear-free" playback.

The Trio64V+ also enhances game acceleration, with support for a sprite plane where sprites are actually rendered into a sprite plane memory. Sprites can be overlaid onto the background without saving and restoring the background.

The Streams Processor is located in the pixel datapath between the display memory and the RAMDAC that drives the RGB signals to the monitor. One of the key advantages of this architecture is that it permits processing of pixel streams on the fly at display refresh rates. This eliminates the need to first write back processed (scaled or color-space-converted) data into the frame buffer before sending it to the RAMDAC. This saves memory storage and memory bandwidth.

The Streams Processor also enables simultaneous display of graphics and video of different color depths. For example, it is possible to display 24 bits/pixel-equivalent video on top of an 8-bit graphics background. This also saves memory bandwidth and storage capacity while permitting higher frame rates because of reduced bandwidth requirements.

In addition, if an opaque rectangular window of one stream is overlaid onto another background window of a second stream, it is not necessary to fetch and refresh the hidden pixels. This provides additional memory bandwidth savings.

S3 Scenic Highway

The S3 Scenic Highway interface directly connects to MPEG-1 audio/video decoders such as the S3 Scenic/MX2™ MPEG-1 audio/video decoder and the C-Cube® CL-480 as well as video digitizers such as Philips® 7110/7111. This provides easy implemen-tation of MPEG-1 or digital video daughtercards that directly plug into the Scenic Highway connector or, alternately, ISA cards, where a ribbon cable is also necessary.

The Streams Processor and Scenic Highway are tightly coupled to provide optimal live video playback. The hardware automatically switches capture and display buffers without software intervention.