



### High-Performance Integrated Graphics/Video Accelerator

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

### S3 Streams Processor Features

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

### Advanced Playback Capabilities

- High-quality hardware-assisted video playback
- 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

- Industry-standard video digitizers
- S3 Scenic/MX2 MPEG-1 audio/video decoder

### Unified Memory Architecture (UMA)

- UMA shares system memory between the host CPU and the graphics/video subsystem
- System memory arbitration compatible with all major core logic vendors including VESA® UMA
- 64-bit DRAM memory interface
- 0.5-, 1-, or 1.5-MByte configurable frame buffer
- Fast page mode, EDO and 1-cycle EDO memory support

### Glueless PCI 2.1 Bus Support

### Multimedia Support Hooks

- 8-bit bidirectional feature connector
- S3 Scenic Highway
- I<sup>2</sup>C 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
- Extensive static/dynamic power management
- DDC monitor communications support

### Industry-Standard 208-pin PQFP package

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## Overview

The S3<sup>®</sup> Trio64UV+™ UMA graphics/video accelerator (hereinafter referred to as Trio64UV+) is the newest member of the extremely successful Trio™ family of products. Based on the Trio64V+™ integrated graphics/video accelerator, Trio64UV+ adds unified memory architecture (UMA) support, allowing system memory to be shared between the host CPU and the graphics/video subsystem. UMA provides a full-featured solution for motherboard designs that dramatically reduces the graphics subsystem cost and footprint. Trio64UV+ is targeted at entry-level systems shipping in the 1996 time frame. It has been developed in conjunction with all major PC system core logic vendors and will be supported in many next generation Pentium™/PCI core logic designs.

## Advanced Architecture/Feature Set

Trio64UV+ provides a 64-bit high performance graphics engine and a 64-bit DRAM interface. The full 64-bit memory data path is used in all frame buffer configurations, which range in size from 0.5 to 1.5 MBytes. Fast page mode DRAMs as well as the latest Extended Data Out (EDO) DRAMs are supported.

## United Memory Architecture (UMA)

Trio64UV+ is the first product offered by S3 to support UMA operation as shown in Figure 1. UMA reserves a portion of main system memory as graphics memory, thus eliminating the need for a separate graphics frame buffer. This allows system manufacturers to significantly reduce the graphics subsystem cost. Since the graphics memory is now an integral part of the host memory bus, CPU accesses to graphics memory are no longer constrained by PCI bandwidth limitations. This drastically reduces the software overhead of many common graphics operations.

## Streams Processor Support

The S3 Streams Processor™ technology processes data from the graphics frame buffer, composes it and outputs the result to the internal DACs for generation of the analog RGB outputs to the

monitor. It can compose data from up to 3 independent streams: (1) Primary Stream—RGB graphics data; (2) Secondary Stream—RGB or YUV/YCbCr (video) data from another region within the frame buffer; and (3) a 64x64x2 hardware cursor.

Arithmetic blending of a primary graphics stream and secondary graphics/video enables dramatic transition effects for game and multimedia applications. Color and chroma keying allow opaque or transparent overlays of one stream on the other.

Simultaneous display of graphics and video of different color depths is provided. For example, it is possible to display true-color (24-bit) video data on top of an 8-bit graphics background. This improves video quality and frame rates while reducing memory bandwidth and storage requirements.

## Multimedia Support Features

Trio64UV+ supports the S3 Scenic Highway™ local peripheral bus for direct connection to video input devices like the S3 Scenic/MX2™ Audio/Video MPEG decoder and industry-standard video digitizers. The Scenic Highway bus and Streams Processor technology are tightly coupled to provide optimal live video playback. The hardware automatically switches capture and display buffers without software intervention.

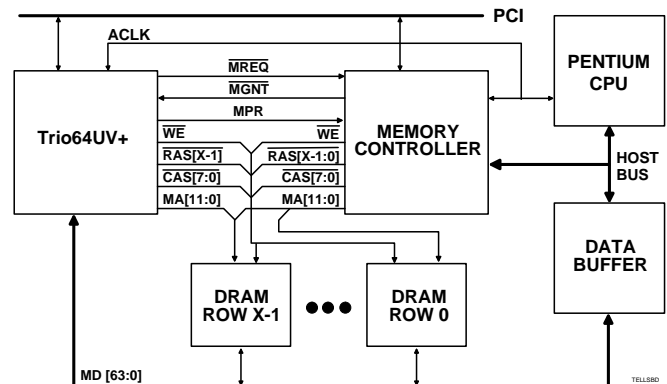


Figure 1. System Block Diagram