S3 Incorporated

High-Performance Graphics Accelerator Core

- Integrated 64-bit graphics accelerator /RAMDAC/clock-synthesizer core enables desktop-level performance
- Supports VGA, SVGA, and XGA flat panel displays
- Provides 1280x1024x8-bit, 75 Hz refresh, non-interlaced CRT mode
- 3.3V/5V operation

Direct Interface to Broad Range of LCDs

- Support for VGA, SVGA and XGA dual-scan/single-scan color panels with 8-bit, 16-bit, and 24-bit interfaces
- Support for VGA, SVGA and XGA TFT color panels with 9-bit, 12-bit and18-bit (1 pixel/clock and 2 pixels/clock) interfaces
- Advanced frame rate control and dithering algorithms provide up to 16.7 million colors
- Panel data polarity switching for EMI reduction
- Auto-expansion and centering for VGA text and graphics modes on SVGA and XGA panels

Industry-Leading Simultaneous Display Capability

- CRT and flat panel refresh rates are independently programmable to allow optimum image quality via DuoView architecture
- Simultaneous TV/flat panel display

Multimedia Acceleration

- Integrated S3 Streams Processor enables 30 frames-per-second, full-screen, 24-bit playback of full motion video
- Mixed-format (simultaneous YUV and RGB) data in video memory
- Blending of graphics and video streams of different color depths
- High-quality hardware scaling using filtered interpolation
- Color key/chroma key control of graphic/video overlay placement

Comprehensive Power Management

- Self-refresh and slow-refresh DRAM support
- Standby and low power suspend modes
- Hardware and software suspend support
- DPMS
- S3 Dynamic Power Management

64x64x2 Pixel Hardware Pop-up Icon

- Available in all modes
- 8 separate bitmaps can be stored

Integrated Programmable Frequency Synthesizers

- Dual, independent frequency synthesizers for DAC and memory control
- DCLK up to 110 MHz @ 3.3V, 135 MHz @ 5V
- MCLK up to 60 MHz @ 3.3V

S3 Scenic Highway™ Video Bus For Low-Cost Multimedia Solutions

- ZV Port compliant
- Glueless 8- or 16-bit interface to video digitizers
- Glueless, bi-directional interface to S3 Scenic/MX2™ MPEG decoder

Integrated TV Encoder

- Direct output to NTSC/PAL monitors
- Composite or SVideo format

Flexible Memory Support

- Fast page or EDO DRAMs
- 1-MByte with 2 256Kx16 DRAMs
- 2-MBytes with 4 256Kx16 DRAMs
- 2-MBytes with 1 512Kx32 DRAM
- 4-MBytes with 2 512Kx32 DRAMs

24-bit True-Color RAMDAC

Glueless PCI Local Bus Interface

PowerPC Support: Bi-endian Byte Ordering

Monitor Plug and Play Support: VESA® DDC

256-pin PBGA Package

- 27.0 mm x 27.0 mm footprint
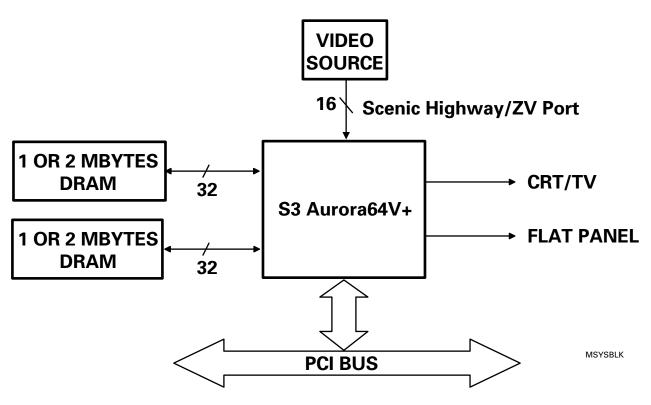- 1.27 mm ball pitch

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Figure 1. System Architecture

The S3® 86CM65 Aurora64V+™ dual display accelerator is the first in a series of highly-integrated flat-panel controller products to be offered by S3 with the goal of providing better-than-desktop features and performance to the notebook computer market. It combines a 64-bit memory interface and graphics engine with a 24-bit high-performance 135 MHz RAMDAC, a flat panel interface capable of controlling the latest STN and TFT panels, S3's Scenic Highway™ multimedia interface and Streams Processor™ video acceleration technology, and direct NTSC/PAL output. These elements, designed around S3's DuoView™ architecture, provide the performance, flexibility, and display quality necessary for premium multimedia notebook computer systems. Comprehensive, flexible hooks are provided to simplify graphics subsystem power management.