High-Performance Integrated 2D/3D Graphics and Multimedia Accelerator

- Integrated 64-bit graphics accelerator/24-bit RAMDAC/clock-synthesizer core
- 66MHz Baseline AGP or 66/33MHz PCI 2.1 Bus Master
- Supports SDRAM/SGRAM up to 83 MHz or 1-cycle EDO DRAM memory up to 66 MHz for 2MB or 4MB display memory configurations @ 3.3V

3rd Generation of S3d™ Graphics Engine

- Flat and Gouraud shading for 3D
- High quality 3D texture mapping
  - Perspective correction
  - Bi-linear and tri-linear texture filtering
  - MIP-Mapping
  - Depth cueing, fogging, alpha blending
  - Video texture mapping
  - 16-bit hardware Z-buffering

Industry-Leading DuoView™ Dual Display Capability

- CRT and LCD refresh rates are independently programmable to allow optimum image quality via DuoView architecture
- Simultaneous TV/LCD operation
- Different images on different displays simultaneously for true multitasking

Improved Multimedia Acceleration

- Integrated S3© Streams Processor™ supports arbitrary stretching with horizontal and vertical interpolation
- Mixed-format (simultaneous YUV and RGB) data in display memory
- Brightness, hue, saturation controls
- Color key/chroma key control of graphic/video overlay placement

S3 Scenic Highway Video Bus For Low-Cost Multimedia Solutions

- ZV Port compliant
- Glueless 8- or 16-bit interface to video digitizers
- I²C serial communications bus

Low Cost, High Quality, Low Power TV-Out Solution

- Integrated 3.3V NTSC/PAL Compatible TV Encoder
- Composite or S-Video output
- 3-Tap Adaptive Flicker Filtering of TV output for high quality

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, XGA and SXGA TFT color panels with 9-bit, 12-bit, 18-bit (both 1 pixel/clock and 2 pixels/clock), and 24-bit 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

Comprehensive Power Management

- 3.3V operation with 5.0V tolerance
- Self-refresh and slow-refresh DRAM support
- Hardware and software standby and suspend support, as well as support for "Hibernation" modes
- DPMS and DDC Monitor communication for GreenPC and CRT Plug and Play support
- S3 Dynamic Power Management

64x64x2 Pixel Hardware Pop-up Icon

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

Integrated Programmable Frequency Synthesizers

- Independent frequency synthesizers for DACs and memory control
- Full speed performance @ 3.3V: DCLK = 135MHz (1280x1024@75Hz), MCLK = 83MHz

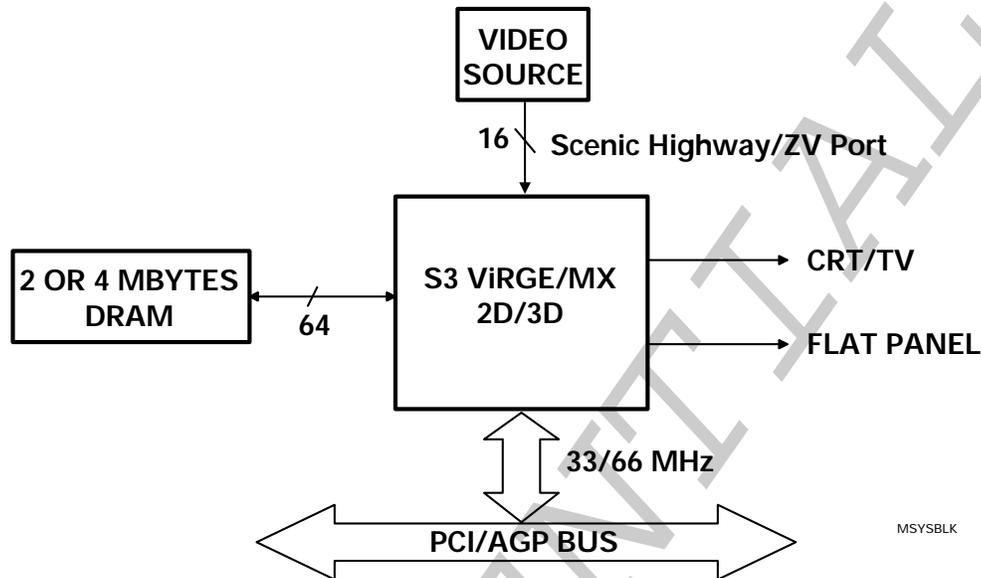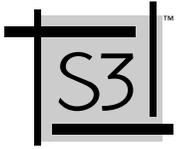### 256-pin, 27.0 mm x 27.0 mm PBGA package

Figure 1. System Architecture

The S3 86C260 ViRGE®/MX 2D/3D accelerator with DuoView architecture provides the combination of features, performance, and power conservation desired for the mobile market. ViRGE/MX is the second 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 computers. It utilizes the award-winning ViRGE 2D/3D engine integrated with a 64-bit synchronous or EDO memory interface, 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 fully integrated, flicker-filtered NTSC/PAL output. These elements are then designed to function with S3's unique DuoView architecture, allowing mobile users to take optimal advantage of their notebook's multiple display capability. Comprehensive, flexible hooks are provided to simplify graphics subsystem power management, while dynamic power control of internal functional modules ensure that power drain is minimized during active operation.

Full Software Support

Video BIOS and drivers supporting the major operating systems and APIs [Windows© 95™, Windows 3.11, Windows NT™, OS/2© 3.0 (Warp™), Direct 3D™, BRender™, RenderWare™, OpenGL™] are provided for OEM customers. The ViRGE/MX supports the S3d™ Toolkit and is compatible with existing S3d logo games supporting 3D acceleration on ViRGE desktop accelerators. ISV and marketing programs funded by S3 ensure abundant title support is available that utilizes the unique and compelling hardware features provided in S3 graphics accelerator products.