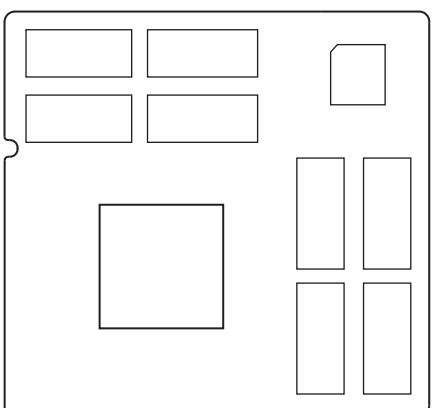
MVG2020

Video Module



Thank you for purchasing this product. Doing so, you contributing in future development of retro hardware solutions.

Contents:

1. Introduction.

MVG2020 is an optional video module designed for Q3D Obsidian 200 SBi and King Shaman cards in order to provide image output for 2D video modes, i.e. it turns your 3Dfx accelerator into a complete solution with support for both 2D and 3D video modes.

This module is based on S3 Virge®/DX™ integrated 2D/3D accelerator and equipped with 4MB 1-cycle EDO RAM. These characteristics provide excellent speed and compatibility for various DOS graphics modes along with support for proprietary S3d API, what makes it very useful for DOS gaming.

This manual assumes that you have some basic skills dealing with PC hardware and software from the last decade of the 20th century. Successful installation requires familiarity with Windows 9x and DOS environments. This includes installing drivers, copying files, managing files in DOS, and running applications within DOS.

2. S3 ViRGE®/DX™ Features.

High-Performance Integrated DRAM-based 2D/3D Graphics and Video Accelerator

- High-performance 64-bit 2D/3D graphics engine
- Integrated 170 MHz RAMDAC and clock synthesizer
- S3 Streams Processor for accelerated video
- Outstanding DOS accelerator

S3d Graphics Engine Features

- High performance 2D Windows acceleration
- Flat and Gouraud shading for 3D
- High quality/performance 3D texture mapping
- Perspective correction
- Bi-linear and tri-linear texture filtering
- MIP-Mapping
- Depth cueing and fogging
- Alpha blending
- Video texture mapping
- Z-buffering

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 a different color depth
- High-quality hardware-assisted video playback with horizontal interpolation
- Support for Indeo, Cinepak, and software and hardware-accelerated MPEG-1video

S3 ViRGE®/DX™ Features cont'd

High-Performance Memory Support

- 64-bit 1-cycle EDO DRAM memory interface
- 4-MByte EDO DRAM 100Mhz rated video memory

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

3. S3 ViRGE®/DX™ Overview.

This part comes from S3 corporation 1996 press release.

The S3® ViRGE™ integrated S3d™ Engine provides 2D acceleration for excellent Windows applications performance and a full-featured high-performance 3D rendering engine for games and other interactive 3D applications.

Improvements over ViRGE™ accelerator:

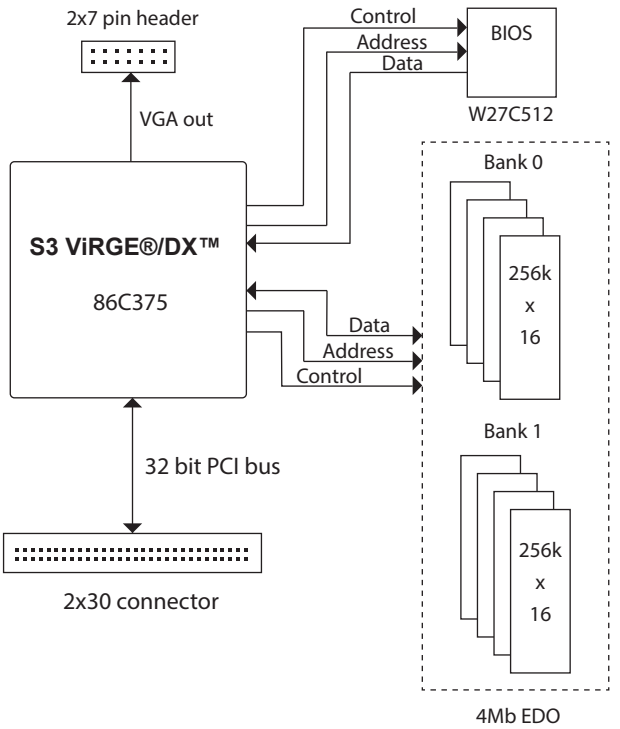
- 170 MHz integrated RAMDAC
- Improved S3d Engine performance
- Streams Processor provides improved video playback quality with vertical interpolation

The S3d Engine incorporates the key Windows accelerator functions of BitBLT, line draw and polygon fill. 3D features include flat shading, Gouraud shading and texture mapping support. Advanced texture mapping features include perspective correction, bi-linear and tri-linear filtering, MIP-Mapping, and Z-buffering. The S3d Engine also includes direct support for utilizing video as a texture map. These features provide the most realistic user experience for interactive 3D applications.

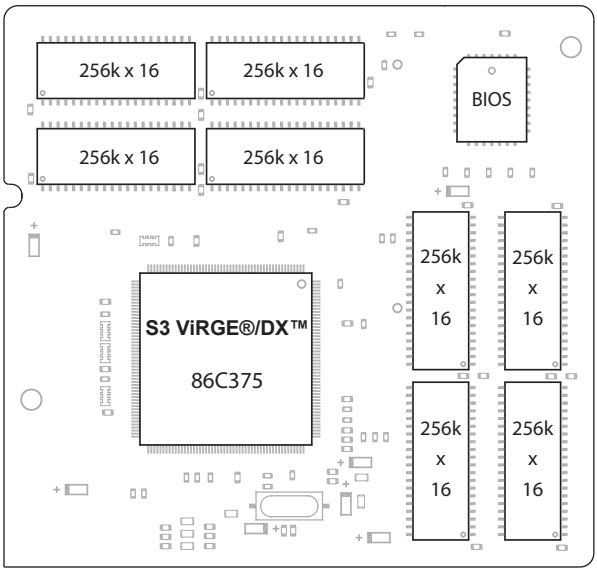
The Streams Processor™ provides the stretching and YUV color space conversion features required for full screen video playback with both software CODECs and hardware MPEG-1 sources.

The ViRGE/DX Streams Processor supports enhanced features such as vertical interpolation for high quality video playback and color controls.

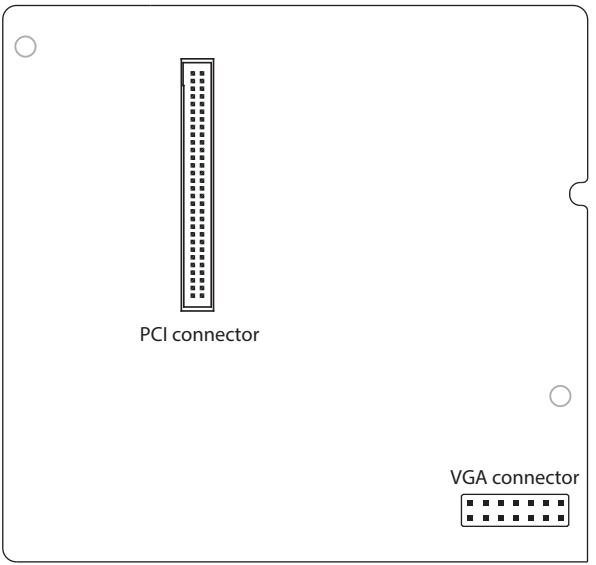
4. Device Functioning Diagram.



5. MVG2020 Top View.

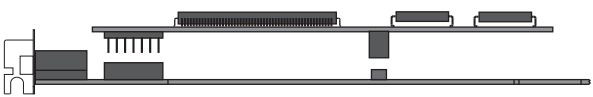


6. MVG2020 Bottom View.

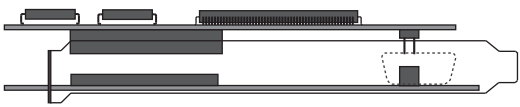


7. Hardware Installation.

This video module is equipped with two connectors on the back side of the board. Main 2x30 pin connector is for PCI bus connection and 2x7 pin header for VGA connection. Make sure that both connectors are aligned properly to their counterparts. See following pics:



View from PCI goldfinger



View from VGA connector side

Gently attach video module to your 3D accelerator and make sure that both module connectors mated firmly with their counterparts.

When the complete setup is installed in the case, please, provide sufficient air flow. Cooling is a factor, if you want stability and long life for your PC components.

8. DOS Usage.

No special requirements for DOS usage. If your system is equipped with a PPro CPU or newer, use tools such as MTRRLFBE to enable video memory write combining to accelerate certain VESA graphic modes. For K6-II or newer CPU use K6WC util. These tools reside in DOSUTILS/MTRR and DOSUTILS/K6WC folders.

To launch S3d supported games use s3dsrvr.exe util, which provides compatibility with this API for ViRGE/DX™ chips. This tool resides at DOSUTILS/S3DPATCH folder of CD disk. Please refer to readme.txt for proper usage of this tool.

9. Installing in Windows™ .

Windows 9x is the recommended Windows based operating system for 2D/3D accelerators aimed for games. Driver for Win9x resides in the Driver folder on the CD disk. See supported desktop resolutions on the next page.

Best looking Windows video mode is 1024x768x24@75. In order to obtain acceptable frame rates for 3D accelerated games, set in-game resolution to 512x384.

10. Supported Desktop Win9x Resolutions.

Resolution	Refresh rates, Hz
640x480x4	60
640x480x8	60,72,75,85
640x480x16	60,72,75,85
640x480x24	60,72,75,85
800x600x4	60
800x600x8	60,72,75,85
800x600x16	60,72,75,85
800x600x24	60,72,75,85
1024x768x8	60,70,75,85
1024x768x16	60,70,75,85
1024x768x24	60,70,75
1152x864x8	60
1280x1024x8	60,75,85
1280x1024x16	60,75
1600x1200x8	60

Below 60Hz and interlaced modes are omitted. 4 bit color depth modes use standard VGA/SVGA driver.

11. Overcloking .

To overclock S3 Virge®/DX™ chip use MCLK utility which resides at the MCLK folder on CD disk. Usage is:
mlck /0 xx x x x.

Please, read carefully the readme.txt file before applying changes. Reference batch file, named as virge.bat, which sets clock to 62Mhz, exists in this folder. Feel free to fine tune it to reach maximum performance from ViRGE®/DX™ chip. PLL registers changes will affect DOS and Windows applications performance, until system reset.

12. Changing Video BIOS.

If you have the intention to change firmware use a chip extractor tool to pull out EEPROM chip from the socket. W27C515 chip can be programmed many times. Use a programmer like minipro TL866 with PLCC32 to DIP adapter. Unfortunately, S3 ViRGE/DX™ lacks built-in flashing routines, hence, the only way to change firmware, is to use an external programmer.

13. Troubleshooting

Try to figure out what kind of problem you encountered, hardware or software. May be very useful to have any other ordinary ViRGE/DX™ based card to compare behaviour.
If you encounter issues such as glitches, freezing, lockups, etc, and it strongly suggests a hardware issue, send your report on **zxc64.hw@gmail.com**

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