S3 Incorporated

*Product Overview*

S3 Trio64

*Integrated Graphics Accelerator*

**High-Performance Integrated DRAM-based GUI Accelerator**

- 64-bit Graphics Engine

**Integrated 24-bit RAMDAC and Programmable Dual-clock Synthesizer**

- 135 MHz maximum output pixel data rate

**High Non-Interlaced Screen Resolution Support**

- 1280 x 1024 x 256 colors
- 1024 x 768 x 64K colors
- 800 x 600 x 16.7M colors

**64-bit DRAM Memory Interface**

- 1-, 2-, and 4-MByte DRAM video memory support
- 256Kx4/8/16 fast-page mode and EDO DRAMs supported

**DDC Monitor Communications Support**

**Extensive Static/Dynamic Power Savings**

**Industry-standard Local Bus Support**

- Glueless PCI bus support (fully compliant with Revision 2.1)
- Glueless VESA VL-Bus support

**Multimedia Features**

- VESA advanced feature connector (VAFC)
- 8-bit bidirectional feature connector support
- S3 memory interface connector (MIC) shared frame buffer support
- Genlocking capability

**Green PC Power Savings Features**

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

**Full Software Support**

- Drivers for all major operating systems
- Video BIOS support
- VGA Register Level Compatibility and Super VGA graphics modes support

**Industry-Standard 208-pin PQFP package**

## Overview

The S3 Trio64™ integrated graphic accelerator (hereinafter referred to as the Trio64) is the first in a series of highly-integrated products to be offered by S3. It combines a 24-bit RAMDAC, dual programmable clock generators, and high-performance accelerator core in a single device. This provides an optimal, cost-effective DRAM-based graphics solution targeted for motherboard designs as well as add-in card applications. By incorporating an enhanced version of the 64-bit graphics engine used in the S3 Vision family products with an on-chip RAMDAC/clock synthesizer capable of 135 MHz output pixel data rates, the Trio64 provides extremely high graphics performance and support of non-interlaced screen resolutions of up to 1280x1024x256 colors at 72 Hz.

## Advanced Architecture/Feature Set

The Trio64 provides a 64-bit high performance Graphics Engine and a 32/64 bit interface to DRAM memory (up to 4 MBytes) for maximum memory bandwidth. Fast page mode DRAMs as well as the latest advanced Extended Data Out (EDO) DRAMs are supported by the Trio64.

An on-chip 24-bit RAMDAC/clock supports output pixel data rates of up to 135 MHz. This allows non-interlaced screen resolutions of up to 1280x1024x256 colors. The Trio64 implements in hardware full acceleration of graphics functions such as BitBLTs with ROPs, 2-point line draws, trapezoidal and polygon fills, clipping, and cursor support for maximum performance. Memory-mapped I/O reads and writes of all command setup and execute registers are also supported. A fast linear addressing scheme reduces software overhead by mapping the display memory into the CPU's upper memory address space and permitting direct CPU access to the display memory.

## Multimedia Support Features

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The Trio64 incorporates genlock circuitry to synchronize graphics output with an external NTSC or PAL signal. It supports an 8-bit bidirectional feature connector or a 16-bit baseline configuration of the VESA Advanced Feature Connector (VAFC) specification to permit video overlay with external video data.

The Trio64 also supports S3's memory interface connector (MIC™). This uses a bus request/bus grant protocol to arbitrate access to a shared frame buffer.

### Full Software Support

S3 provides comprehensive software driver support for Microsoft Windows, Windows NT, OS/2 and SCO OpenDesktop, DOS applications drivers available include AutoCAD and Microstation PC. The Trio64 is based upon the same architecture as other S3 accelerators, ensuring driver compatibility and reliability. Full video BIOS support is also provided.

### Green PC/Monitor Plug and Play Support

The Trio64 provides full hardware and BIOS support for VESA's Display Power Management (DPMS) protocol. This allows the video subsystem to put a DPMS-compliant monitor into power savings modes in order to meet the EPA's "Energy Star" requirements. The Trio64 also supports the VESA Display Data Channel (DDC) standard that permits transfer of monitor identification and resolution support data.

| **Trio64 Resolutions** | **DRAM Size** | | |
|---|---|---|---|
| **Resolution** | **1 MB** | **2 MB** | **4 MB** |
| 640X480X4 | ✔ | ✔ | ✔ |
| 640X480X8 | ✔ | ✔ | ✔ |
| 640X480X16 | ✔ | ✔ | ✔ |
| 640X480X32 | | ✔ | ✔ |
| 800X600X4 | ✔ | ✔ | ✔ |
| 800X600X8 | ✔ | ✔ | ✔ |
| 800X600X16 | ✔ | ✔ | ✔ |
| 800X600X32 | | ✔ | ✔ |
| 1024X768X4 | ✔ | ✔ | ✔ |
| 1024X768X8 | ✔ | ✔ | ✔ |
| 1024X768X16 | | ✔ | ✔ |
| 1024X768X32 (IL) | | | ✔ |
| 1152x864x8 | ✔ | ✔ | ✔ |
| 1280X1024X4 | ✔ | ✔ | ✔ |
| 1280X1024X8 | | ✔ | ✔ |
| 1280X1024X16 (IL) | | | ✔ |
| 1600X1200X4 (IL) | ✔ | ✔ | ✔ |
| 1600X1200X8 (IL) | | ✔ | ✔ |