

Savage4 Shows Substantial Speedup

S3's Second Savage Silicon Should See Superior Success

by Peter N. Glaskowsky

Once the most successful company in the PC-graphics industry, S3 has fallen on hard times of late. Without a competitive new 3D engine to offer, S3 did poorly in 1997. Though 1998 saw the announcement of Savage3D—a respectable midrange 3D chip—that device didn't ship until late in the year and was not well received by S3's major OEM customers. The company has now unveiled the successor to Savage3D, a chip called Savage4, that offers greatly improved performance and a few new features that fill gaps in the previous product's market coverage.

S3 continues to sell substantial quantities of its older Virge and Trio chips, but the company's quarterly reports show it loses money on these sales. In the most recent quarter, S3 reported a net loss of \$70 million on just \$42 million in sales. Recently, the company entered into a relationship with Intel (see MPR 12/28/98, p. 4) that gives S3 a limited license to Intel technology, including the P6 bus. Using this license, S3 plans to develop a core-logic chip set with integrated 3D graphics. Such a product is unlikely to ship before the end of this year, however. To survive that long, S3 must start making a profit on sales of its standalone graphics chips. Savage4 should help it accomplish this goal.

S3 Claims Lead in 4× AGP Development

As part of the Intel relationship, S3 became Intel's first announced 4× AGP validation partner. This partnership

gives S3 special access to Intel's core-logic development team, and it should help ensure that Savage4 will work well with Intel's 820 (Camino) chip set when the 820 ships in mid-1999. S3 is not the only company working so closely with Intel, however. Most leading graphics-chip vendors are participating in the 4× AGP validation effort. S3 is merely one of the first graphics-chip companies to have a 4×-capable chip ready for testing.

Savage4 will be a midrange 3D chip when it ships in 2Q99. Figure 1 shows Savage4's internal organization. The chip's dual-texturing pipeline is its most significant upgrade over Savage3D (see MPR 7/13/98, p. 16), which can apply only one texture to each pixel. Among announced chips, Savage4 is unique in its ability to blend two trilinear-filtered textures onto a single pixel in each clock cycle, even with 32-bit textures. This capability requires the chip to fetch 16 four-byte texture samples per clock. Savage4 doesn't have enough memory bandwidth to sustain this fetch rate, but the chip's texture cache can provide most of the needed bandwidth.

The new Savage4 chip includes an enhanced texture-decompression unit. Incorporating new features for the S3 texture-compression (S3TC) algorithm, such as 8-bit coding and true alpha blending, the improved texturing unit should produce significantly better visual results than were seen with Savage3D. S3 is pursuing an aggressive program to win support for S3TC from major 3D-game developers.

The increased quality comes with higher performance, expected to reach about 140 Mpixels/s, with two textures per pixel. This exceeds the dual-texturing performance of current 3D accelerators, such as Nvidia's Riva TNT and ATI's Rage 128, but falls short of the speed of 3Dfx's Voodoo3, which should be available at about the same time.

S3 (www.s3.com) has announced three versions of Savage4. Savage4 Pro will be priced at \$25 and will support 4× AGP and 32M of 143-MHz local memory. The \$22 Savage4 GT is aimed at current mainstream PCs. The GT will support only 2× AGP and 16M of 125-MHz memory. For low-end applications, S3 will also offer Savage4 LT, which is virtually identical to the GT but accepts only 8M of memory and will sell for just \$19. All three products are sampling now and will ship in 2Q99.

With its new capabilities and very reasonable prices, Savage4 will be more attractive to the OEMs who passed on Savage3D but who continue to buy less-expensive S3 chips, such as its Trio3D business-graphics accelerator.

S3 has demonstrated that it can sell high volumes of chips for less than their manufacturing cost. Now the company must relearn the trick of earning a profit on its products. Savage4 may be just the product to do it. □

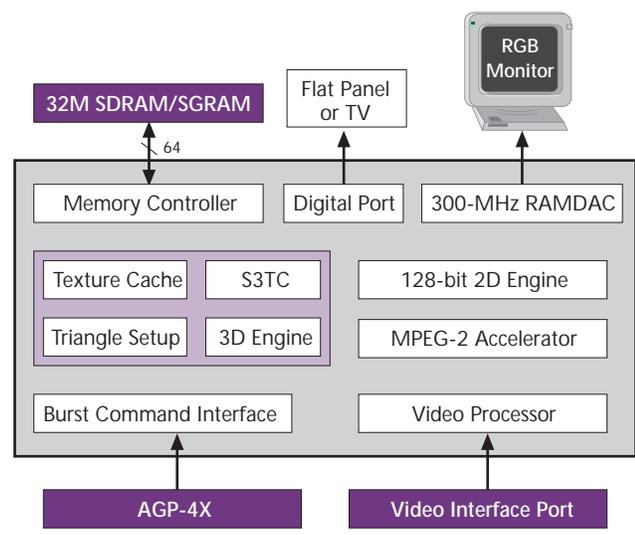


Figure 1. S3's Savage4 includes a dual-texturing 3D engine, enhanced S3 texture compression (S3TC), a 300-MHz RAMDAC, and support for up to 32M of SDRAM or SGRAM.