NVIDIA EXPANDS GEFORCE LINE

GeForce2 MX Cuts Cost, Adds Features

By Peter N. Glaskowsky {7/24/00-02}

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Not content with dominating the market for high-performance PC graphics chips, NVIDIA has released a new midrange chip that is sure to put new pressure on its competitors. The new GeForce2 MX brings the key features of NVIDIA's high-end GeForce2 GTS (see

MPR 5/15/00-02, "WinHEC Sees Great 3D"), including geometry acceleration and programmable shading, to midrange PCs. The new chip's greatly expanded multimonitor capability will also cut into market niches now held by chips such as Matrox's G450.

NVIDIA derived the GeForce2 MX's 3D core from that of the GeForce2 GTS by removing two of the GTS's four pixel pipelines. Even with just half the peak rendering performance of its progenitor, the MX is still faster than all but a few competing graphics chips, and only one of those—ATI's Radeon 256, also introduced at WinHEC—is likely to match the MX's price. NVIDIA says dropping the two pipelines greatly reduced the chip's die size (though it would not give specific numbers) and manufacturing cost, even with its extra features. Table 1 shows the key features of the two NVIDIA chips and ATI's Radeon 256, which will compete with both GeForce products.

That NVIDIA could make substantial changes to one of its chip designs and ship the result just six weeks later speaks well of the company's engineering capabilities. As the company expands into new markets, including integrated-graphics chip sets (see MPR 10/6/99-msb, "NVIDIA Allies With ALi on Integrated Chip Set") and—we expect—

mobile applications, the pressure on its engineers will only grow. So far, they seem more than able to carry the load.

Differences Less Important Than Similarities

There were other changes between the GeForce2 GTS and MX chips. Where the GTS incorporates a digital-video scaling and filtering engine that supports all HDTV modes up to 1,920 x 1,080 pixels, the MX supports HDTV output

	NVIDIA GeForce2 GTS	NVIDIA GeForce2 MX	ATI Radeon 256
Bus Interface	PCI/AGP 4×	PCI/AGP 4×	PCI/AGP 4×
Memory Width	64/128, DDR/SDR	64/128, DDR/SDR	64/128, DDR/SDR
Max. Memory Clock	200MHz	166MHz	200MHz
Maximum Memory	128M	64M DDR/128M SDR	128M
Geometry Engine	Yes	Yes	Yes
Core Clock Rate	200MHz	175MHz	200MHz
Pixel Pipelines	4	2	2
Multitexturing	2 textures/pixel	2 textures/pixel	3 textures/pixel
Shading Engine	Yes	Yes	Yes
RAMDAC Speed	350MHz	350MHz	350MHz
Max. Res. at 85 Hz	2,048 × 1,536	2,048 × 1,536	2,048 × 1,536
HDTV Resolution	1,920 x 1,080, 30i	1,280 x 720, 60p	1,920 x 1,080, 30i
Video Outputs	TV out, Digital	TV out, Digital	YPrPb, Digital
Video Inputs	VIP 2.0	VIP 2.0	VIP 2.0
LCD Support	Single-channel TMDS	Dual-channel TMDS	Single-channel TMDS
Availability	Now	Now	Now

Table 1. The GeForce2 MX was derived from NVIDIA's earlier GeForce2 GTS by dropping two of four rendering pipelines and improving its multimonitor support.

at resolutions up to 1,280 x 720 pixels only. This restriction requires the HDTV-decoding software or hardware to perform a format conversion during the decoding process—but all such decoders already incorporate the necessary functionality to allow HDTV content to be presented on common TVs and PC monitors, few of which support the 1,920 x 1,080-pixel display mode.

Like the GTS, the MX includes a built-in flat-panel display interface. The MX's interface is unique among all graphics chips currently on the market, however, sporting a dual-channel TMDS transmitter port that can also drive two independent single-channel TMDS links. Given the high price of desktop LCDs, this dual-display mode will be of interest primarily in niche markets, such as stock brokerages, where multiple LCDs are used to display large amounts of data while consuming little floor space. Assuming NVIDIA offers a mobile version of the MX, which seems likely, the second interface could be used to drive an external flat-panel display.

With an external RAMDAC, the MX can drive two CRTs at the same time; an NTSC/PAL output supports TVs. The MX can be configured to display independent images on any two of its outputs. This ability, which NVIDIA has dubbed "TwinView," eliminates one of the few remaining selling points for Matrox's G450.

NVIDIA also touts the addition of a feature called Digital Vibrance Control (DVC). NVIDIA says DVC can be used to enhance color separation and intensity, but the company has not described how DVC accomplishes these goals.

The MX's cost reductions from the basic GeForce2 GTS design allow the MX to match the price points of previous NVIDIA graphics chips, such as the RIVA TNT2, while offering better performance and valuable new features. The GeForce2 MX will extend NVIDIA's reach into market niches no previous NVIDIA chip has served, eliminating the toeholds that have supported the company's dwindling competition.

ATI is now NVIDIA's only remaining serious adversary in the discrete 3D-chip business; we expect the two companies to split this market between them over the next year or two, leaving little room for other vendors except in integrated-graphics chip sets and CPUs. Both companies have their own integrated efforts, but the competition in this area from companies such as Intel and VIA is especially strong. As long as NVIDIA can design and implement products as good as the GeForce2 MX, its continued success is assured. ◇