



World's Fastest Discrete Graphics Memory From Micron Powers NVIDIA's Breakthrough Gaming Speeds

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Micron GDDR6X accelerates photorealistic 3D experiences at 1 terabyte per second, rates once thought impossible

BOISE, Idaho, Sept. 01, 2020 (GLOBE NEWSWIRE) -- Micron Technology, Inc. (Nasdaq: MU), today announced the world's fastest discrete graphics memory solution, [GDDR6X](#), the first to power system bandwidth up to 1 terabyte per second (TB/s). Working with visual computing technology leader NVIDIA, Micron debuted GDDR6X in the new [NVIDIA® GeForce RTX™ 3090 and GeForce RTX 3080 graphics processing units](#) (GPUs), which are tailored to support the fast speeds that immersive, high-performance gaming applications demand.

"Our multilevel signaling innovation in GDDR6X has shattered conventional bandwidth limits, clocking record-breaking speeds," said Tom Eby, senior vice president and general manager of the Compute & Networking Business Unit at Micron. "Unlike traditional memory, GDDR6X has unparalleled data rates that can keep pace with gaming innovation and data-hungry applications — setting a new standard for graphics memory."

Micron's GDDR6X serves as a powerful enabler of [NVIDIA GeForce RTX 3090 and GeForce RTX 3080](#) graphics cards' performance. Building on its most recent collaboration with NVIDIA for the [GeForce RTX graphics card \(enabled by GDDR6\)](#), Micron transforms the memory/GPU interface with GDDR6X, accelerating performance on complex graphics workloads across next-generation gaming applications.

"With the unprecedented speed of GDDR6X, Micron has delivered tomorrow's memory technology today, and it's at the heart of NVIDIA GeForce RTX 3090 and 3080 GPUs — helping us deliver rich, realistic, cinematic user experiences," said Jeff Fisher, senior vice president of the GPU Business Unit at NVIDIA. "Building on a history of collaboration that started with GDDR5, we're thrilled to have reinvented the memory/GPU interface with Micron, setting a new bar for high-performance, high-resolution gaming."

As PC gaming evolves in sophistication, gamers today demand the highest performance for their advanced graphics cards — a requisite for smooth animation, sharp visuals, 8K resolution and real-time ray tracing, a rendering technique that results in realistic light reflections and cinematic effects. GDDR6X's groundbreaking speed offers discerning gamers high-resolution experiences with maximum frame rates and instant rendering, allowing users to experience highly realistic and reactive effects without jarring lags. Combined with NVIDIA's GeForce RTX 3090 and GeForce RTX 3080 GPUs, GDDR6X's ultra-bandwidth capabilities improve real-time ray tracing and neural graphics processing to create photorealistic and immersive virtual worlds in PC games.

The new [NVIDIA GeForce RTX 30 Series GPUs](#) — the second generation of the NVIDIA RTX PC gaming platform — feature new ray tracing cores Tensor Cores and streaming multiprocessors. The results are stunning visuals, amazingly fast frame rates and artificial intelligence acceleration for games and creative applications. Powered by the NVIDIA Ampere architecture, which delivers increases of up to 1.9 times performance-per-watt over the previous generation, the RTX 30 Series effortlessly powers graphics experiences at all resolutions, even up to 8K. The series represents the greatest GPU generational leap in NVIDIA's history.

Beyond the Binary: First to Implement PAM4 in Memory, Micron Sets New Benchmark

Micron achieved GDDR6X's breakthrough bandwidth by applying innovative signal transmission technology, four-level pulse amplitude modulation (PAM4), to revolutionize how memory moves data. Since 2006, Micron's engineers and researchers have explored applying multilevel signaling to the memory interface. Over 45 patents later, Micron is the [first in the industry to implement PAM4 in memory](#), creating a new benchmark for future generations of graphics memory.

By using PAM4 multilevel signaling techniques, GDDR6X transfers data much faster, doubling the input/output (I/O) data rate. Until now, graphics memory was capped at 64 gigabytes per second (GB/s), transmitting one bit per cycle through the traditional binary standard, which relies on two signal levels to transmit data encoded as 1s or 0s. Instead, Micron's novel PAM4 technique employs four distinct levels to transmit two bits of data to and from the memory at a time. As a result, Micron's GDDR6X dramatically increases memory bandwidth to 84 GB/s for each component, translating to system bandwidth of up to 1 TB/s — rates once thought impossible.

Micron's GDDR6X is also the only memory device using PAM4 that can be designed and built in mass production volumes, bringing cutting-edge I/O research to market. With its board design and packaging carefully fine-tuned for simplicity by Micron's graphics memory experts, GDDR6X offers customers easy implementation and less manufacturing complexity than other high-bandwidth solutions on the market. Notably, GDDR6X doubles the data rate in a channel without doubling the required operating frequency, creating a smooth, real-time experience for gamers.

In addition, GDDR6X delivers lower power per transaction (pJ/bit) than previous generations, making it ideal for energy-sapping workloads like gaming and other high-bandwidth graphics applications, which demand both lightning fast and low-power memory. GDDR6X also features the ability to scale power down or up, allowing users to dial back performance to save energy.

Availability

The GeForce RTX 3080 is available for purchase starting Sept. 17, and the GeForce RTX 3090 is available starting Sept. 24 on [NVIDIA's website](#). Both will be available as custom boards, including stock-clocked and factory-overclocked models from top add-in card providers and in gaming systems from leading OEMs and system builders.

GDDR6X is now available as part of Micron's new [Ultra-Bandwidth Solutions portfolio](#). Micron delivers GDDR6X memory in 8 gigabits (Gb) density, with speeds of 19 to 21 Gb/s. Starting in 2021, 16Gb density units will be added. Partners and customers interested in exploring GDDR6X for their

high-performance solutions — whether for gaming, artificial intelligence inference or professional visualization — can find out more [here](#).

Resources

- NVIDIA press release: [NVIDIA Delivers Greatest Ever Generational Leap in Performance With GeForce RTX 30 Series GPUs](#)
- NVIDIA announcement replay: [GeForce Special Event Replay with NVIDIA CEO Jensen Huang](#)
- NVIDIA GeForce feature story: [GeForce RTX Series Graphics Cards: The Ultimate Play](#)
- Micron blog: [GDDR6X: Memory Reimagined](#)
- Micron infographic: [GDDR6X Infographic](#)
- Micron video: [GDDR6X: Bringing Gaming and AI to Life](#)
- Micron video: [Feeding the Beast: the Making of GDDR6X](#)
- Micron technical brief: [Doubling I/O Performance with PAM4](#)
- Micron technical brief: [The Demand for Ultra-Bandwidth Solutions](#)

About Micron Technology, Inc.

We are an industry leader in innovative memory and storage solutions. Through our global brands — Micron® and Crucial® — our broad portfolio of high-performance memory and storage technologies, including DRAM, NAND, 3D XPoint™ memory and NOR, is transforming how the world uses information to enrich life for all. Backed by more than 40 years of technology leadership, our memory and storage solutions enable disruptive trends, including artificial intelligence, 5G, machine learning and autonomous vehicles, in key market segments like mobile, data center, client, consumer, industrial, graphics, automotive, and networking. Our common stock is traded on the Nasdaq under the MU symbol. To learn more about Micron Technology, Inc., visit micron.com.

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