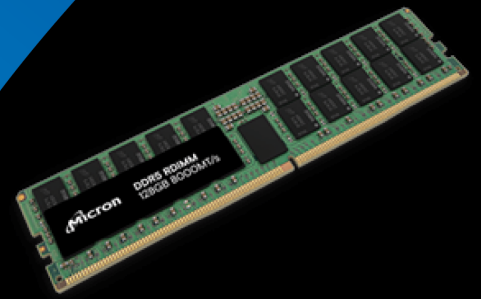


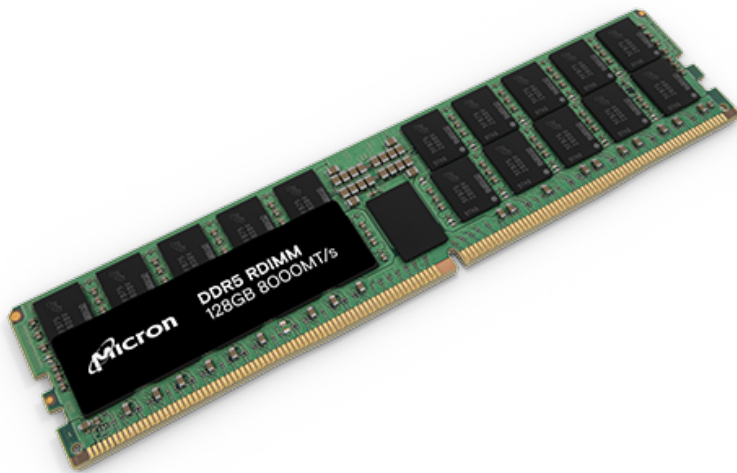
# High-capacity DDR5 solution from Micron's leading-edge 1 $\beta$ (1-beta) technology



Micron is first to enable the market with a monolithic 32Gb-based DDR5 128GB DRAM module that delivers the fastest speed and lowest latency for enabling generations of server platforms to come.

Micron's DDR5 128GB RDIMM module, based on our 1 $\beta$  (1-beta) 32Gb technology, delivers high performance and better energy efficiency for memory-intensive applications including generative AI training and inference, real-time data analytics, and in-memory databases.

Built using Micron's industry-leading 1 $\beta$  process node technology, which uses advanced CMOS device technology, Micron DDR5 128GB RDIMM enables up to 6TB of system memory capacity and data rates up to 8,000MT/s.<sup>1</sup>



## Key benefits

### Fast Performance for AI in the data center

Micron high-capacity DDR5 delivers up to 28% faster performance for AI training<sup>2</sup>.

### Up to 16% improved latency<sup>3</sup>

Important for memory-bound workloads such as generative AI, in-memory databases, and real-time data analytics, where high-capacity is needed, and prompt response times are critical for real-time inference.

### Highest Bandwidth DDR5 with capability up to 8000 MT/s

### Low power and energy efficiency for datacenter workloads

>24% improved energy efficiency (pj/bit)<sup>3</sup>

### Innovative 1 $\beta$ technology

- >45% improvement in wafer bit density using Micron's leading 1-beta technology based on 32Gb die, enabling the best bit density in the industry.<sup>3</sup>
- Micron's 1 $\beta$  128GB RDIMM helps to balance CPU core counts with memory capacity, bandwidth, and power for optimized system performance, enabling future datacenter infrastructure.

1. Based on x86 systems with dual-socket, 12 channels per socket, and 2 DIMMs per channel.

2. 28% faster training time is a projected value at 8000MT/s based on empirical measurements of AI/ML model runs at different memory frequencies.

3. As compared with commercially available competitive 3DS modules.

# Micron 1β enables generations of server platforms to come

Industry's fastest speed, lowest latency DDR5 based on a 32Gb monolithic die, Micron 1β will be available in 5600MT/s, 6400MT/s, 7200MT/s, and 8000MT/s, enabling future generations of server platforms. Micron's 1β 16Gb-based modules are available in 16GB, 32GB, and 64GB module densities for general compute applications not requiring larger capacities.

## Micron DDR5 Modules

MT	C	40	F	2	0	4	7	S	1	R	C	80B	B	1
<b>Module Capacity</b>							<b>Module Type</b>					<b>DDR5 Module Speed</b>		
<b>CODE</b>	<b>CAPACITY</b>						<b>CODE</b>	<b>DESCRIPTION</b>				<b>Module Speed Bin (Part Mark)</b>	<b>Component JEDEC Speed Bin</b>	
5	32GB						R	288-pin RDIMM X80				56B	DDR5-5600B	
6	64GB											64B	DDR5-6400B	
7	128GB											72B	DDR5-7200B	
												80B	DDR5-8000B	

Contact Micron Field Sales Network for more information.

## Product Specifications

Specification	Value
Data Rate	8000MT/s
Nominal Voltage (V <sub>DD</sub> /V <sub>DDQ</sub> /V <sub>PP</sub> )	1.1V/1.1V/1.8V
Burst Length	BL16, BC8
Bank Count (x4)	32
Module Configuration/Form Factor	2Rx4 RDIMM
DRAM Component Density	32Gb
Module Capacity	128GB
Power Consumption	10W @ 4800
Operating Temperature	0-95C
DRAM Component Package Size	7.5x11.5x1.0mm
32Gb tRFC1/tRFC2/tRFCsb	410/220/190ns
JEDEC Specification Compliance	JESD79-5B
JEDEC-Optional Feature Support	MBIST/mPPR
	ARFM/DRFM
	4-phase clocking
	Clock Sync
	Rx DQS CTLE

# Improved AI inference and training

Micron’s high-capacity, high-speed DDR5 128GB RDIMM enables and accelerates memory-bound workloads such as training for Large Language Models (LLMs). Micron DDR5 128GB RDIMM shows up to 28% improvement in AI training performance<sup>4</sup>. Llama 2 was chosen as a benchmark to evaluate the training and inference times because it best reflects modern LLMs (for example, ChatGPT).

## Training for Llama 2

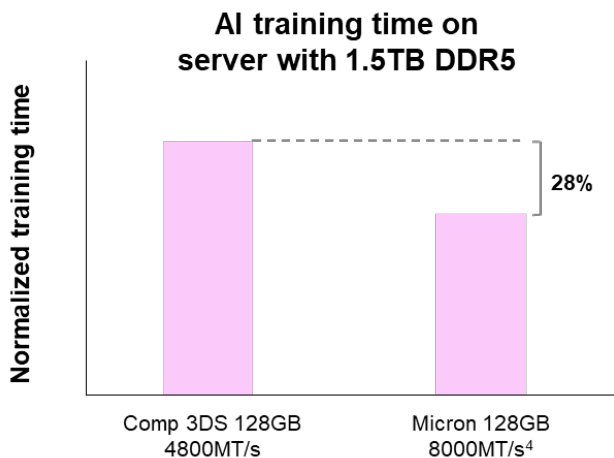


Figure 1. Llama 2 Training Time Projection

## Inference for Llama 2

For inference and power consumption results using Llama 2, 3DS TSV RDIMM modules show up to 48% higher power when compared to Micron’s DDR5 128GB RDIMM.

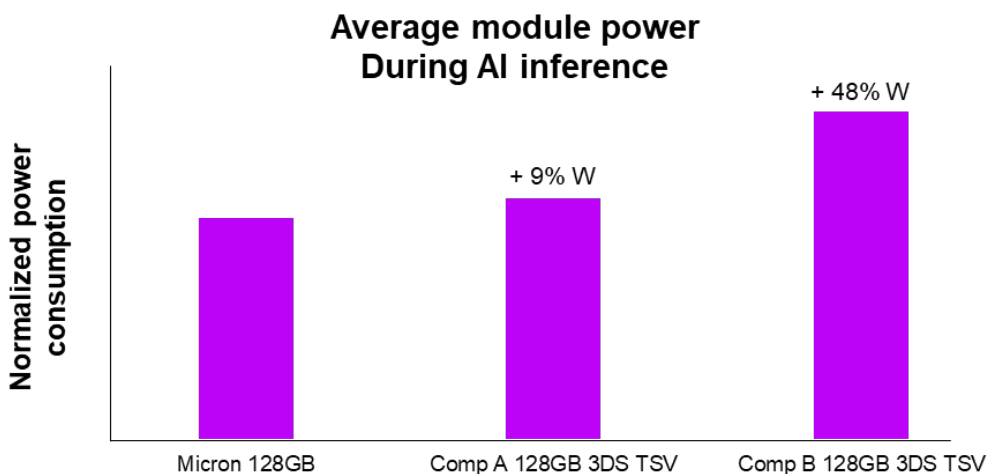


Figure 2. Llama 2 Inference and Average Module Power

4. The 28% training time projection at 8000MT/s is based on empirical measurements of AI/ML model runs at different memory frequencies.

[micron.com/ddr5](https://micron.com/ddr5)

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