“Of all the emerging memory technologies, HMC is the one that will likely have the most impact in the long run.”

Electronic Design

HITTING THE MEMORY WALL

Traditional DRAM technology has hit a wall. For network system development beyond 100 Gb/s, efficiency and performance gains are increasingly smaller and harder to achieve. A higher-performance memory solution is needed for data packet processing, data packet buffering, and storage applications.

For enterprise and computing applications, the challenges include higher-performance processing and exponential bit growth requirements. A more energy-efficient memory solution is a must for managing power and total cost of ownership (TCO).

THE SOLUTION IS IN THE CUBE

The memory wall seemed insurmountable—until now. Micron’s Hybrid Memory Cube (HMC) combines advanced logic and DRAM layers into one optimized 3D package that leverages through-silicon via (TSV) technology. The result is a category of memory unlike anything on the market today.

HMC performance levels break through the memory wall, delivering a high-bandwidth, energy-efficient, high-density memory system that will enrich next-generation networking and drive significant reductions in data center and supercomputing power consumption.

Your New Standard for Memory Performance

KEY APPLICATIONS

NETWORKING

HMC’s impressive 160 Gb/s bandwidth boosts networking systems’ capabilities to match line speed performance in the face of ever-increasing global demand for mobility and the impact of cloud services.

COMPUTING SYSTEMS

HMC’s high bandwidth, low energy/bit, pin savings, and smaller form factor are game changers for high-performance computing (HPC) applications. Plus, the abstracted interface and logic layer enables designers of next-generation system architectures to see their designs in a different light in terms of memory, system hierarchy, and overall system optimization.
KEY BENEFITS

**INCREASED BANDWIDTH** Provides up to 15X the bandwidth of a DDR3 module

**REDUCED POWER** Uses up to 70% less energy per bit than existing memory technologies

**SMALLER SIZE** Reduces the memory footprint by nearly 90% compared to today’s RDIMMs due to HMC’s stacked architecture

**SCALABLE** Includes logic layer flexibility, which enables HMC to be tailored to multiple platforms and applications

**REDUCED LATENCY** Enables significantly lower system latency as a result of HMC’s massive parallelism

**ULTRA RELIABILITY** Delivers greater resilience and field repairability with a new paradigm of system-level, advanced RAS features that include embedded error checking and correction capabilities

**ABSTRACTED MEMORY** Devote more time to leveraging HMC’s revolutionary features and performance and less time to navigating complex memory parameters thanks to HMC’s abstracted memory interface

**LOW TCO** Lowers TCO thanks to HMC’s high performance, low energy, and RAS capabilities

### High-Performance Memory Comparison

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<th>REQUIREMENTS</th>
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<th>Board Footprint</th>
<th>Energy Efficiency</th>
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<td>90% simpler than DDR3L</td>
<td>95% smaller than DDR3L</td>
<td>66% greener than DDR3L</td>
<td>10.2X greater than DDR3L</td>
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<td>88% simpler than DDR4</td>
<td>94% smaller than DDR4</td>
<td>55% greener than DDR4</td>
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### HMC-15G-SR SPECIFICATIONS

HMC is designed using the HMC Consortium’s Short Reach (SR) PHY definition and is available in a 31mm x 31mm package that provides 160 GB/s bandwidth.

### REQUIREMENTS TCO VALUATION

- **Channel Complexity**: HMC is 90% simpler than DDR3L and 88% simpler than DDR4.
- **Board Footprint**: HMC is 95% smaller than DDR3L and 94% smaller than DDR4.
- **Energy Efficiency**: HMC is 66% greener than DDR3L and 55% greener than DDR4.
- **Bandwidth**: HMC is 10.2X greater than DDR3L and 8.5X greater than DDR4.

### “...the greatest advancement in memory technology”

Softpedia

### “...a smart fix”

Jim Handy, memory analyst at Objective Analysis

### “...an entirely new category of memory”

Tom’s Hardware

### “...a dramatic step forward in memory technology”

Fudzilla.com

### “...unprecedented levels of memory performance”

Electronic News

YOUR PATH TO UNPRECEDEDENTED PERFORMANCE

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