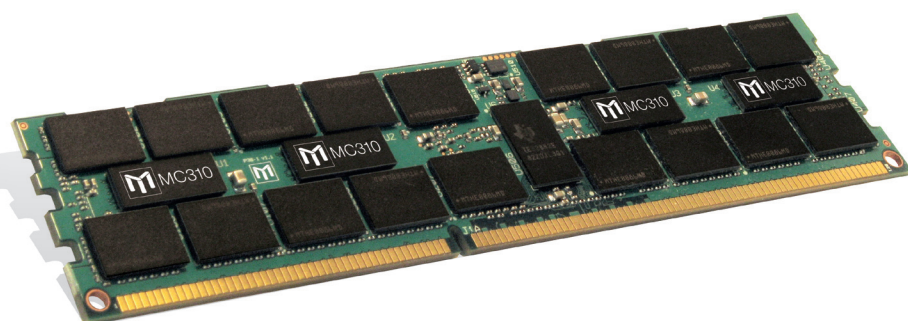


DDR3 MetaSDRAM™

The MetaSDRAM RDIMM combines a MetaSDRAM chipset with 36, 72 or 144 mainstream 1Gb SDRAMs to provide a 4GB, 8GB or 16GB RDIMM that is compatible with all DDR3 RDIMM Sockets. The 4GB and 8GB chipsets are designed to operate at 1333MT/s with up to three DIMMs per memory channel. The 16GB chipset is designed to operate at 1066MT/s with up to three DIMMs per channel. Dual-rank, 8GB and 16GB MetaSDRAM RDIMM samples are available now from Hynix Semiconductor.



8GB DDR3 MetaSDRAM RDIMM

Bus Speed	DIMM 2	DIMM 1	DIMM 0	Total Capacity
1333 MT/s	4GB	4GB	4GB	12GB
	X	8GB	8GB	16GB
	8GB	8GB	4GB	20GB
	8GB	8GB	8GB	24GB
1066 MT/s	X	16GB	16GB	32GB
	8GB	16GB	16GB	40GB
	16GB	16GB	16GB	48GB

DDR3 MetaSDRAM RDIMMs – Larger Capacity at Any Bus Speed

META-SDRAM OVERVIEW

MetaSDRAM is a RDIMM socket compatible solution that closes the gap between processor computing power, which doubles every 18 months, and DRAM capacity, which doubles only every 36 months. Before MetaSDRAM, the industry had to choose between under-utilizing their computing hardware power due to a lack of memory, or adding higher capacity and exponentially more expensive DRAM to each DIMM on the motherboard.

The MetaSDRAM Controllers sit between the memory controller and the DRAMs to solve the memory capacity problem cost effectively by enabling up to four times more mainstream DRAMs to be integrated onto standard DIMM formfactors, without any hardware or software changes. The MetaSDRAM controller is invisible to the memory controller of the system, and allows the memory controller to simply “think” it is working with larger SDRAMs.

META-SDRAM PERFORMANCE

MetaSDRAM solves one of the biggest issues with putting more memory into a system today: memory bus speed decreases as more loads (DIMMs) are placed on the bus. The MetaSDRAM chipset presents a single electrical load to the memory bus independent of the number of DRAMs on the RDIMM. MetaSDRAM RDIMMs are designed to operate at 1333MT/s for up to 24GB of memory in a memory channel, and 1066MT/s for up to 48GB of memory in a channel.

THE NEED FOR MORE MEMORY

MetaSDRAM RDIMMs are designed for high performance servers and workstations that run compute-intensive applications such as CAD/CAM/EDA simulations, database, business intelligence, OLTP, digital content creation, and virtualization. These and other heavy workload applications are the backbone of industries such as aerospace, automotive, animation, oil and gas exploration, biotechnology, and semiconductor design and simulation.

VIRTUALIZATION AND SERVER CONSOLIDATION

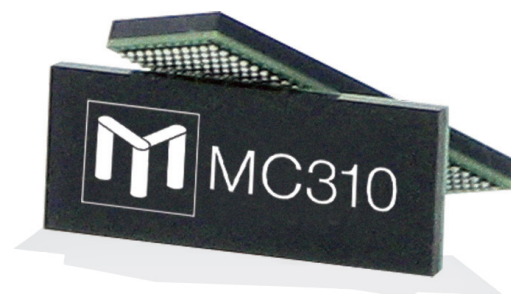
The IT demands of companies are exploding, yet the average server in a datacenter is operating at only 15%** of its capacity. Multicore processors and virtualization software hold the potential for companies to significantly lower their IT costs and datacenter power consumption by consolidating applications onto fewer servers. However, this requires servers with large amounts of memory. MetaRAM provides a simple and cost-effective way to add memory without degrading system performance.

META-SDRAM CHIPSET AVAILABILITY

- **DDR3 MetaSDRAM MR16G3 chipset** enables dual-rank 16GB DIMMs and is capable of functioning at speeds up to 1066MT/s.
- **DDR3 MetaSDRAM MR08G3 chipset** enables dual-rank 8GB DIMMs and is capable of functioning at speeds up to 1333MT/s.
- **DDR3 MetaSDRAM MR04G3 chipset** enables single-rank 4GB DIMMs and is capable of functioning at speeds up to 1333MT/s.

DDR3 META-SDRAM RDIMM FEATURES

- 240-pin, registered dual in-line memory module
- PC3-6400, PC3-8500, PC3-10600 data transfer rates
- One or two independent ranks, single electrical load
- WakeOnUse™ power saving technology
- Support for SECDED error detection and correction
- Support for x4 ChipKill™
- 8 internal device banks per rank for concurrent operation
- x4 or x8 DIMM Operation
- Programmable burst length: 4 or 8
- Differential data strobe (DQS, DQS#)
- On-die termination (ODT)
- 64ms, 8192-cycle refresh
- Serial presence detect EEPROM (SPD)
- JEDEC standard 1.5V I/O (SSTL_18 compatible)
- $V_{DD}=V_{DDQ}=1.425V$ to $1.575V$
- $V_{DDSPD}=1.7V$ to $3.6V$



DDR3 MetaSDRAM Controller

ABOUT METARAM

MetaRAM is a fabless semiconductor company focused on improving memory performance. The company's product – MetaSDRAM™ – enables four times the amount of standard memory to be placed into existing systems without any modifications. The company is privately held, and venture funded by Kleiner Perkins Caufield and Byers, Khosla Ventures, Storm Ventures, and Intel Capital and is headquartered in San Jose, California. For more information, please go to www.metaram.com.

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** Michael Kanellos, GreenTech Media