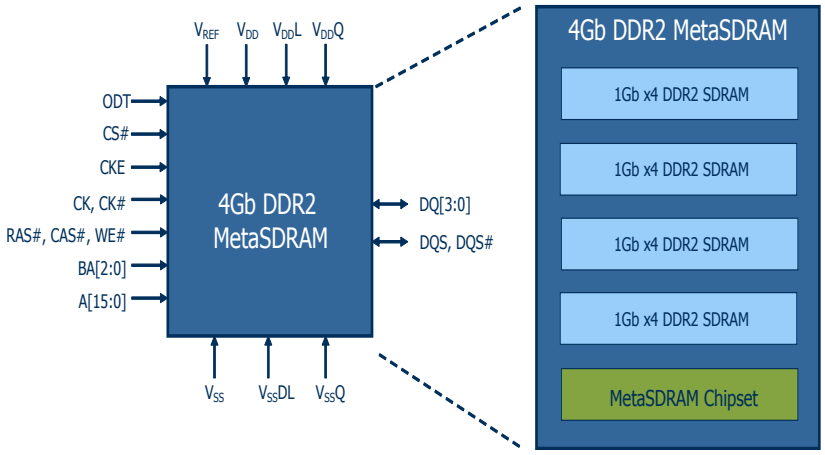
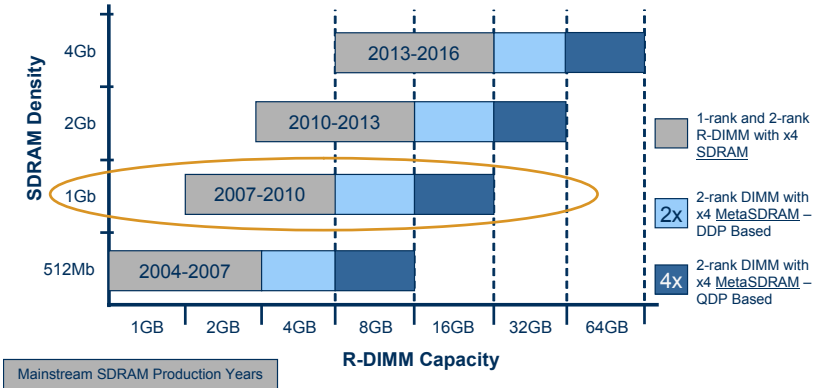
DDR2 MetaSDRAM™

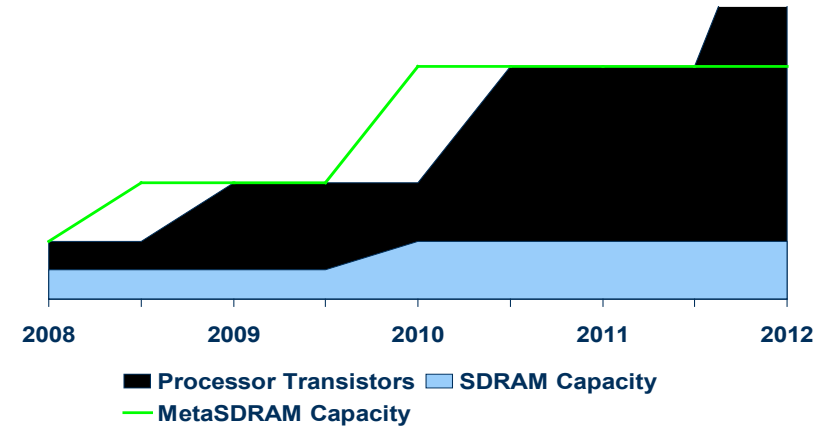
MetaSDRAM provides a solution to the persistent gap between memory and processing improvements – processor computing power doubles every 18 months, while memory capacity lags, doubling only every 36 months – a gap that is limiting system performance. Without MetaSDRAM, the industry addresses this gap by adding higher capacity, but exponentially more expensive DRAM to each dual in-line memory module (DIMM) on the motherboard, or simply makes do without more memory.



4Gbit MetaSDRAM logical representation



MetaSDRAM extends module capacity by two generations of SDRAM



MetaSDRAM accelerates DRAM Density by 2 to 4 years!

MetaSDRAM Overview

MetaRAM's DDR2 MetaSDRAM is a new memory technology that doubles or quadruples the amount of mainstream DDR2 SDRAMs that can be integrated onto RDIMMs without the need for any system hardware or software changes. The MetaSDRAM chipset makes multiple DDR2 SDRAMs look like a larger capacity DDR2 SDRAM to the memory controller. The result is "stealth" high-capacity memory that circumvents the normal limitations set by the memory controller. This new technology accellerates DRAM density by 2-4 years.

Bridging the Performance Gap

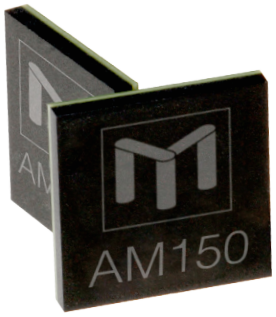
MetaSDRAM provides a solution to the persistent gap between memory and processing improvements - processor computing power doubles doubles every 18 months, while memory capacity lags, doubling only every 36 months - a gap that is limiting system performance. Without MetaSDRAM the industry attempts to address this gap by adding higher capacity, but exponentially more expensive DRAM to each dual in-line memory module (DIMM) on the motherboard, or simply makes do without more memory.

MetaSDRAM not only increases the capacity of the memory in servers and workstations but also has the capability of increasing the operating frequency of the DIMM modules. Because the MetaSDRAM chipset acts as a buffer between the SDRAM and memory controller, it reduces the electrical loading on the memory bus, and the variance in I/O timing thereby improving the signal integrity in the channel.

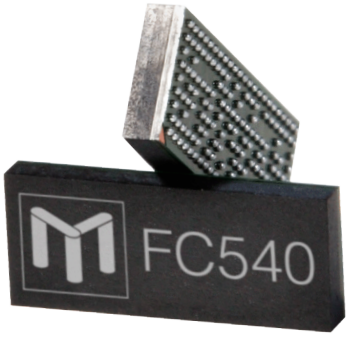
DDR2 MetaSDRAM Features

The DDR2 MetaSDRAM chipset contains two types of ASICs designed and manufactured by MetaRAM: the Access Manager, responsible for address and command management, and the Flow Controller, responsible for data management. Each MetaSDRAM chipset is optimized for low power and high performance. MetaRAM's DDR2 MetaSDRAM features include:

- **WakeOnUse™ power management** improves the power efficiency of the DRAMs, thus enabling two to four times the memory to fit into a typical system's power delivery and cooling capabilities.
- **Dynamic command scheduler** ensures that the MetaSDRAM is compatible with the JEDEC DDR2 protocol.
- **Low latency circuit design and an innovative clocking scheme** allow the MetaSDRAM-based DIMMs to drop seamlessly into existing servers and workstations.
- **Unique split-bus stacked DRAM** designs enables flexible access of the multiple DRAMs in a stack.



AM150: MetaRAM DDR2 Access Manager



FC540: MetaRAM DDR2 Flow Controller

MetaSDRAM Chipset Availability

- **MetaSDRAM MR08G2 chipset** enables 2 Rank 8GB DIMMs and is capable of functioning at speeds up to 667MT/s. It consists of an AM150 Access Manager and 5 FC540 Flow Controllers working as a group.
- **MetaSDRAM MR16G2 chipset** enables 2 Rank 16GB DIMMs and is capable of functioning at speeds up to 667MT/s. It consists of two AM160 Access Managers and 9 FC540 Flow Controllers.

About MetaRAM

MetaRAM is a fabless semiconductor company focused on improving memory performance. The company's first 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.