I'M High-density DDR3 memory components and modules

8 Gigabit DDR3 DRAM components with Single Chip-Select
16 Gigabyte DDR3 DIMM and SO-DIMM Modules with optional ECC

The worldwide demand for memory capacity continues to grow. Presently, the largest available density of monolithic DRAM components is 4 Gigabit in DDR3. With the next generation of manufacturing process technology, manufacturers plan to increase the capacity to 8Gbit per monolithic DRAM device. But the true date of an affordable, proven process for manufacturing such components is still just a target sometime in the future. Manufacturer roadmaps continue to change quarter by quarter, along with a global market who's timeline for acceptance of the newest technologies is all but unsure as well. But the one constant that remains is the customer's requirement to get bigger, faster, and better memory within the shortest time possible.

Industrial applications with soldered-down-DRAM often suffer from physical space constraints, resulting in a demand for high capacity memory-devices that fit in small spaces.

Modern microservers, embedded PC's, and industrial computers often have only one to four module-sockets for unbuffered memory modules (UDIMMs) and unbuffered SO-DIMMs. Many of these applications require large amounts of memory-capacity, but today's process limitations only allow DDR3 modules with a capacity of 8 Gigabyte per unbuffered DIMM. And the visible demand for UDIMM modules with 16 GB capacity continues to grow.

Existing Solutions

A manufacturing process known as a 'dual die package' (DDP) has become popular over the last few years. DDP IC's combine two bare memory dies stacked inside one common chip-package. Separate control-lines for each die are connected to the balls of the FBGA-IC package. The assembled DDP chip is then accessible by the processor as if there were two separate components on the board, although both are inside one package.

This is a smart way to double memory capacity but it requires a layout change since two sets of control-lines need to be provided to the memory component. Unfortunately this special layout prevents the usage of standard single Chip Select (monolithic) DRAMs as an alternative assembly. Also some processors lack the additional control-lines to support this way of memory expansion.

Hence this existing 8Gbit DDP solution requires too many special considerations which have prevented their widespread acceptance and use.

The I'M Intelligent Memory Solution

To cope with the challenge of achieving double memory density without the necessity of two seperate sets of control wires IM has developed a unique way to manufacture 8 Gigabit DDR3 SINGLE CHIP SELECT components with existing DRAM process technologies.
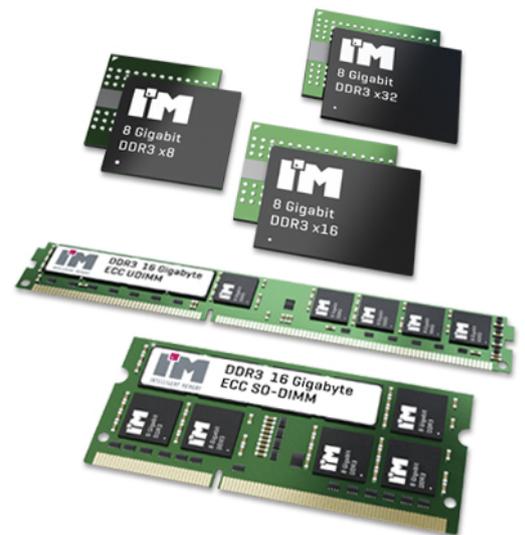
Go Beyond Limits with I'M Intelligent Memory

- Highest capacity DDR3 IC with Single-CS on the market

- Available in x8 and x16 organization

- "Plug-and-play" compatible to conventional JEDEC standard DRAMs

- World's first 16 Gigabyte unbuffered DIMMs and SO-DIMMs

- Also available optional with ECC

The processor will see these new components like a monolithic device

I'M 8 Gbit Single-Chip-Select components are compatible to the JEDEC pinout of monolithic devices and provide the simplest path to upgrade applications using DDR3 DRAM. They allow for new maximum levels of memory capacity without altering existing board-layouts or designs. Compared to 4 Gigabit devices, there are no additional physical address lines required on the layout. Thus, any application that is able to address 4Gbit DDR3 components will also be physically able to address the 8Gb Single-CS components. The row/column/bank addressing of these 8 Gbit components matches the specifications per JEDEC JESD79-3.

Unbuffered DIMMs and SO-DIMMs with 16 Gigabyte

I'M Intelligent Memory offers the very first 16 Gigabyte unbuffered DIMMs and SO-DIMM memory modules, based on the I'M 8 Gigabit DDR3 Single-CS components. The modules follow the two rank JEDEC specification. When using memory modules on a motherboard, the required settings for the memory controller are retrieved by the system BIOS from the SPD-Eeprom on the memory module. Some of the available BIOS programs are not yet prepared to identify and work with the settings of 16 Gigabyte modules, even though all settings have been standardized by JEDEC for years. I'M Intelligent Memory continues to work closely with the processor and chipset manufacturers, as well as BIOS programmers and customers, to help with the required modifications.

At present, I'M 16GB DIMMs have been verified to be compatible with a number of chipsets and platforms. These include a variety of processors from AMD, Freescale and Cavium. Intel has recently released an updated BIOS for their Atom C2000 series, codename 'Avoton', which also accommodates for the use of I'M 16GB Modules. BIOS updates can be requested by the customer from their processor manufacturer directly, or Intelligent Memory can assist in providing the appropriate contacts to do so.

Summary

Intelligent Memory has developed the first 8Gb DDR3 IC in a single chip select DDP design. The net effect is the processor effectively recognizing a monolithic IC in 8Gb DDR3, which allows for simpler upgrades from 4Gb DDR3 IC based designs. I'M Intelligent Memory chips offer extended and industrial temperature support with little to no changes to the board itself. 8Gb DDR3 IC's allow for the wide release of high density DDR3 modules in a variety of form factors.

Some I'M modules have already been verified to work on a number of hardware platforms. The processor families used on these varying platforms include several AMD Chipsets, Cavium Octeon and Intel C2000 series. Customers using an off-the-shelf BIOS for the memory-initialization may have to request updates from their BIOS-supplier for a modification/update before being able to use the I'M 16GB modules.

For more information and to order samples, please contact I'M Intelligent Memory today

Product list DDR3 8 Gigabit Single-CS components

Part No.	Capacity	Org.	Voltage	Package	Speed	Temperature
IM8G08D3E(F)BBG	8Gbit Single-CS	1Gx8	1.5 (1.35) Volt	FBGA 78	1333/1600	Comm., Ind.
IM8G16D3E(F)BBG	8Gbit Single-CS	512Mx16	1.5 (1.35) Volt	FBGA 96	1333/1600	Comm., Ind.

Product list DDR3 16 Gigabyte SO-DIMM memory modules

Part No.	Capacity	Org.	Voltage	Pin-Count	Speed	Temperature
IMM2G64D3(L)SOD8AG	16 GB SO-DIMM	2Gx64	1.5 (1.35) Volt	204 Pin	1333/1600	Comm., Ind.
IMM2G72D3(L)SOD8AG	16 GB ECC SO-DIMM	2Gx72	1.5 (1.35) Volt	204 Pin	1333/1600	Comm., Ind.

Product list DDR3 16 Gigabyte UDIMM memory modules

Part No.	Capacity	Org.	Voltage	Pin-Count	Speed	Temperature
IMM2G64D3(L)DUD8AG	16 GB UDIMM	2Gx64	1.5 (1.35) Volt	240 Pin	1333/1600	Comm., Ind.
IMM2G72D3(L)DUD8AG	16 GB ECC UDIMM	2Gx72	1.5 (1.35) Volt	240 Pin	1333/1600	Comm., Ind.