

SAMSUNG 58NM 1GBIT DDR3 SDRAM (K4B1G0846E)



Semiconductor
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ABOUT THIS DEVICE

Samsung's latest 58nm 1Gbit DDR3 SDRAM (K4B1G0846E) features the most advanced Samsung DDR3 SDRAM product Semiconductor Insights (SI) has analyzed to date. This device has a 58nm process node and boasts 1Gbit of memory with impressive die area efficiency of 24Mbits per mm².

Samsung made significant improvements to their DRAM technology over the past several process generations. At the 80nm process node they have adopted 6F2 cell technology. This time around one of the outstanding changes is the reduction of metal layer. With only three layers of metal interconnect, this 58nm 1Gbit DRAM achieves the highest Mbits per mm² efficiency seen in any 1Gbit DDR3 SDRAM product.

Semiconductor Insights is currently analyzing major circuit blocks of this device to better understand the manufacturer's move in developing this DDR3 product.

Semiconductor Insights' in depth analysis of the 58nm DRAM circuit analysis combined with already finished process technology analysis on the 58nm 1Gbit DDR2 SDRAM will help shed light on the different choices, optimization and trade-offs Samsung has made to maintain its leadership in the DRAM market.

Semiconductor Insights expects that the 58nm 1Gbit DDR3 SDRAM will be Samsung's main product in the growing DDR3 market in 2009 and beyond.

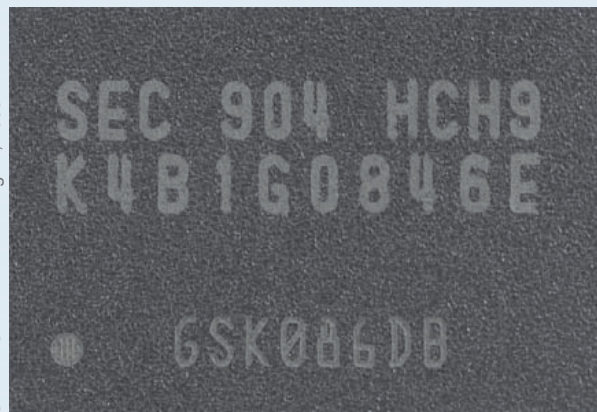
APPLICATION

The application areas for the 1Gbit DDR3 SDRAMs include PC's such as laptops, servers, and other consumer electronics.

COMPETING NAND VENDORS

Hynix, Micron, Elpida

Source: Semiconductor Insights, 2009



Package Photograph of the Samsung 58nm DDR3 SDRAM

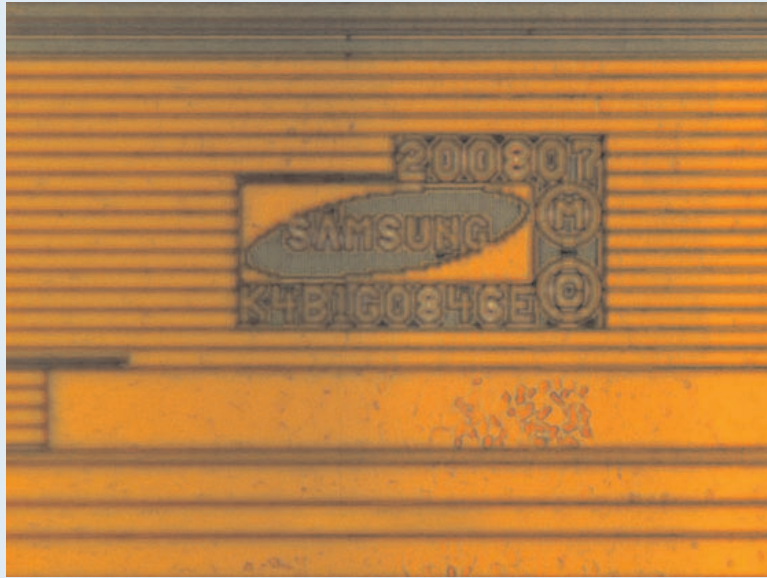
DEVICE HIGHLIGHTS

The following details were taken from the manufacturer's product information.

- Adoption of the latest 58nm DRAM process technology JEDEC standard VDD = 1.5V Power Supply
- VDDQ = 1.5V
- DQ shielding, self calibration and fly-by topology for better signal control
- Bidirectional DQS (differential default)
- BL = 4, 8 (8 bits prefetch)
- 8 banks architecture
- External RESET pin

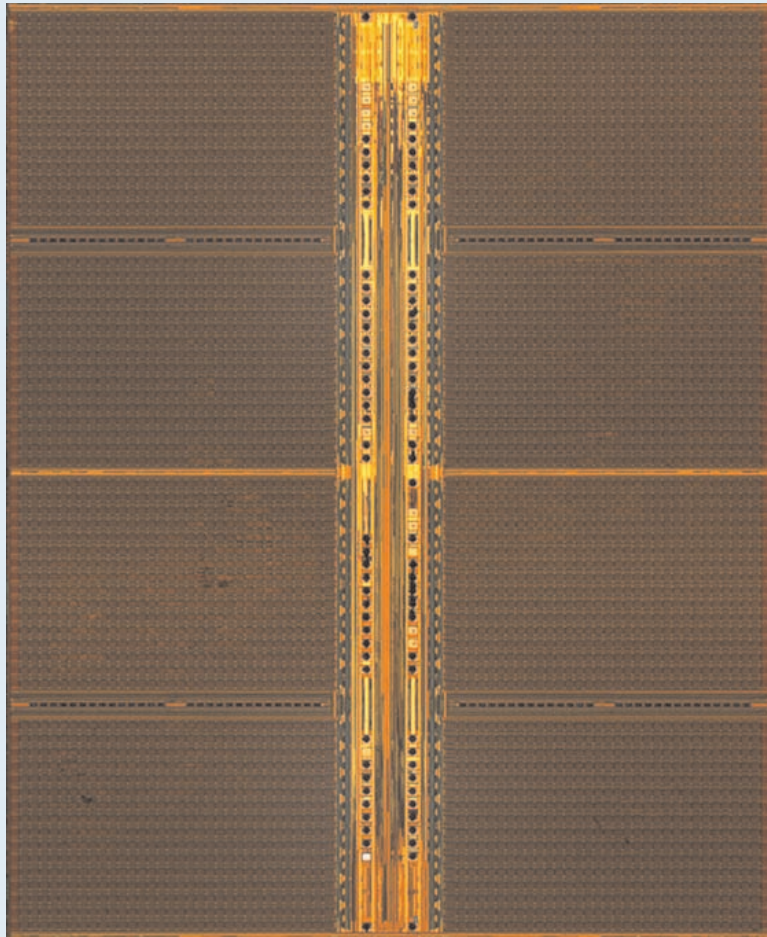


Source: Semiconductor Insights, 2009



Die Markings of the Samsung 58nm DDR3 SDRAM

Source: Semiconductor Insights, 2009



Die Photograph of the Samsung 58nm DDR3 SDRAM