

# SAMSUNG 42NM 16GBIT NAND FLASH (K9GAG08U0D)



Semiconductor  
insights<sup>inc.</sup>

## ABOUT THIS DEVICE

Samsung's latest Multi-Level Cell (MLC) NAND Flash features an advanced floating gate 42nm NAND Flash process. To date, this is the most advanced NAND Flash process Semiconductor Insights (SI) has analyzed by this manufacturer.

This latest product features 16Gbit of non-volatile memory storage and has a chip size of 114mm<sup>2</sup>, a 30% reduction from the previous 51nm 16Gbit MLC NAND Flash product (K9GAG08U0M).

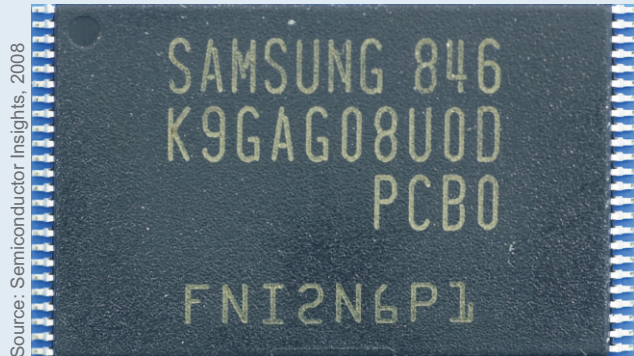
The new architecture looks slightly different from the previous generation. Samsung has placed all the pads on one edge of the die and there is only one row decoder strip located in the centre of the die. The previous node had two row decoder strips effectively reducing wordline length. Initial analysis of the Samsung K9GAG08U0D revealed some notable process improvements including use of new interconnect material, which might help explain the architectural choices that the manufacturer made with this device. It also appears that Samsung has implemented very interesting measures to achieve reliable operations at this advanced geometry.

## APPLICATION

Samsung provides a very small form factor solution for high density, solid-state storage. Samsung's NAND Flash memory products are optimized for general solid-state storage, image file storage and audio for applications such as MP3 players, solid-state drives, digital cameras, audio appliances, set-top boxes and industrial storage.

## COMPETING NAND VENDORS

Toshiba, IM Flash Technologies, Hynix, Numonyx



Package Photograph of the Samsung 42nm 16 Gbit NAND Flash

## DEVICE HIGHLIGHTS

- Voltage supply:
  - 2.7V device: 2.5V ~ 2.9V
  - 3.3V device: 2.7V ~ 3.6V
- Organization: 2G x 8bit
- Automatic Program and Erase
- Page Read Operation
- Memory Cell: 2bit / Memory Cell
- Command/Address/Data Multiplexed I/O Port
- Hardware Data Protection
- Reliable CMOS Floating Gate Technology
- Command Register Operation

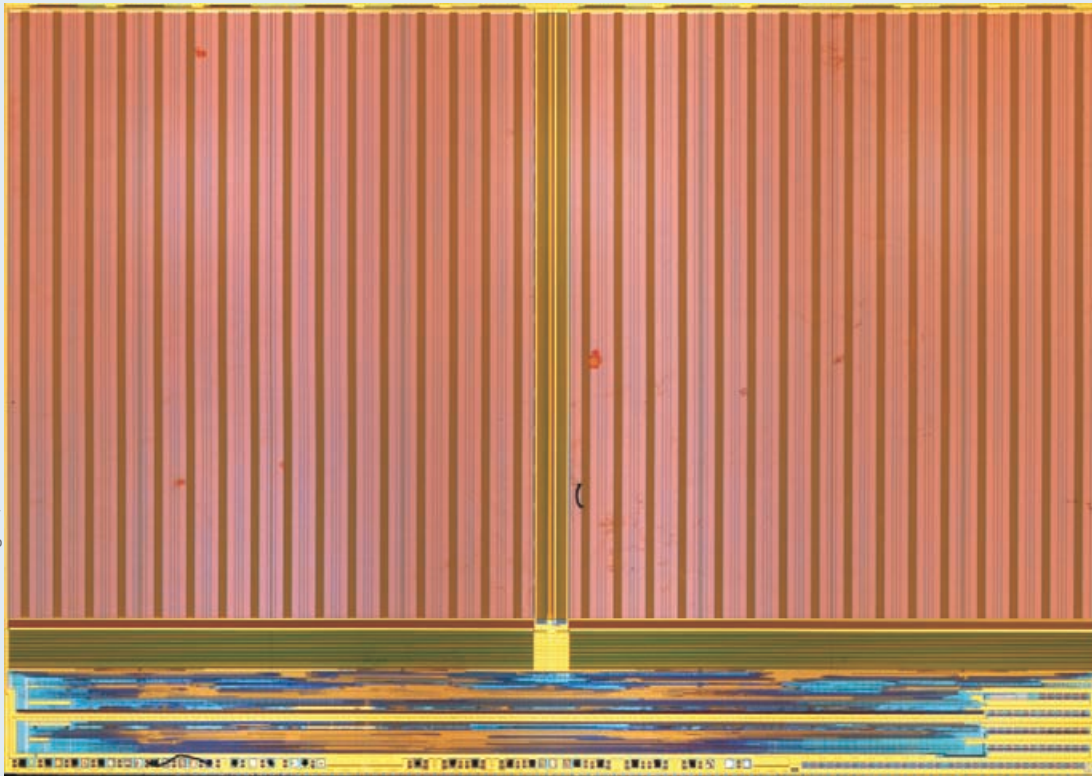


Source: Semiconductor Insights, 2008



Die Markings of the Samsung 42nm 16 Gbit NAND Flash

Source: Semiconductor Insights, 2008



Die Photograph of the Samsung 42nm 16 Gbit NAND Flash