

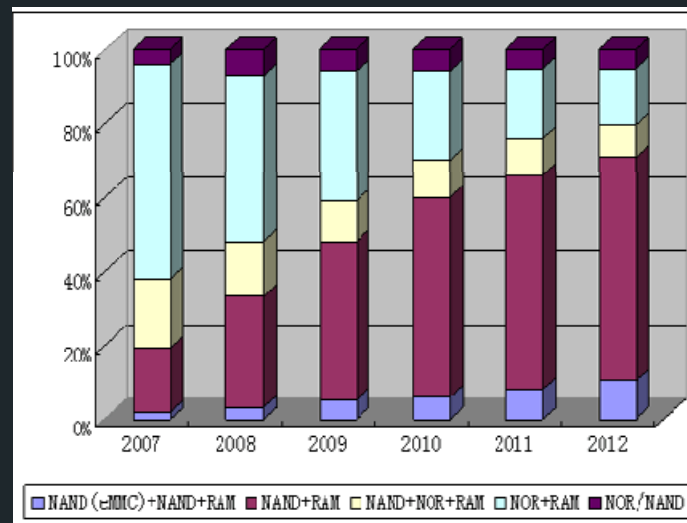
## Cell Phone Memory Industry Report, 2009



512Mb is a threshold in NOR flash memory, and the cost increases rapidly if it is higher than 350Mb. In addition, NOR flash memory has applied for limited fields and fewer clients. However, NAND flash memory has more and more cost advantages as capacity grows larger, and it has widely applied for more clients. Currently, the cell phone market changes rapidly, and the life cycle of a cell phone is usually less than five years, so NOR's most outstanding advantage, long life, becomes meaningless as well. Although NOR flash memory cost will decline sharply after the entry of 65nm, Spansion is the sole which engages in NOR field. While in NAND, the powerful companies such as Samsung, Toshiba, Hynix, Micron and Intel all have gathered, and a large number of researchers will be involved once NAND has met any problems. Spansion, once No.1 in cell phone memory, has retreated from such field.

NAND will replace NOR flash memory if it is higher than 350Mb. The majority of manufacturers believed that it was not necessary that cell phones are with large-capacity NAND memory since they can rely on external memory card to achieve it. However, when cell phones with built-in large-capacity NAND memory launched by a small number of manufacturers have become popular, and others all have successively entered such field. Now, most of cell phone built-in NAND flash memory capacity becomes larger and larger, reaching 32 Gb at most, and promoted by eMMC, the smart phone NAND capacity is 1Gb at least.

### Development Trend of Cell Phone Memory Configuration, 2007-2012



Source: ResearchInChina

Presently, all smart phones are provided with NAND+RAM memory, and around 60% of high-end cell phones have used NAND+RAM memory as well. In general, the medium and low-end cell phones adopt NOR+RAM memory, and most of ultra-low-end cell phones use NOR memory.

Except Apple, Sony Ericsson and Nokia, all smart phone manufacturers all adopt Samsung's high-capacity memory. Toshiba has covered a high share in medium-end market, and Nokia's support for eMMC has made Toshiba have larger development space. The main clients of Numonyx are Sony Ericsson, unlicensed cell phone manufacturers in China, Apple and manufacturers from Japan. Without support of RAM, Numonyx NAND+RAM memory has developed slowly. Spansion is adept in NOR, but serious lack of technologies for NAND and RAM. Being the new comers, Micron and Hynix both have shown powerful strength in NAND+RAM field, and they are capable of seizing market share from Samsung. Hynix has become Motorola's supplier, and LG is also with great possibility to become another customer.

#### Main Cell Phone Memory Manufacturers and Clients

Manufacturer	Clients
Sam sung	all cell phone manufacturers
Toshiba	LG, Motorola, Samsung, Unlicensed Cell Phone Manufacturers in China, K-Touch, Lenovo, TCL
Numonyx	Sony Ericsson, Unlicensed Cell Phone Manufacturers in China, Apple, Manufacturers in Japan
Spansion	Nokia, Unlicensed Cell Phone Manufacturers in China, Manufacturers in Japan
Micron	Sony Ericsson
Hynix Sharp	Unlicensed Cell Phone Manufacturers in China, Motorola Sam sung

Source: ResearchInChina

# Table of Contents

- **1 Status Quo and Future of Cell Phone Memory**
  - 1.1 Built-in Memory
  - 1.2 Development
  - 1.3 Market & Industry
  - 1.4 Packaging
  - 1.5 DRAM Industry
  - 1.6 DRAM Packaging
  - 1.7 NAND Flash Memory Industry
  - 1.8 NAND Flash Memory Development
  - 1.9 NAND Flash Memory Packaging Development
  - 1.10 SSD
  - 1.11 NAND Control-IC Industry
  - 1.12 EMMC
  - 1.13 BA NAND, EMMC and LBA NAND
- **2 Cell Phone Market & Industry**
  - 1.1 Global Cell Phone Market
  - 2.2 Global Cell Phone Industry
- 2.3 China's Cell Phone Market
- 2.4 China's Cell Phone Export
- 2.5 China's Cell Phone Industry
- **3 Memory of Cell Phone Manufacturers**
  - 3.1 Nokia
  - 3.2 Motorola
  - 3.3 Samsung
  - 3.4 Sony Ericsson
  - 3.5 LG
  - 3.6 RIM
  - 3.7 Apple
  - 3.8 HTC
  - 3.9 Study on China's Cell Phone Memory
- **4 Memory Manufacturers**
  - 4.1 Samsung
  - 4.2 Macronix

- 4.3 Inotera
- 4.4 PowerChip
- 4.5 HYNIX
- 4.6 ELPIDA
- 4.7 NUMONYX
- 4.8 Toshiba
- 4.9 SPANSION
- 4.10 MICRON
- 4.11 Winbond
- 4.12 SST
- 4.13 Etron
- 4.14 ESMT

## Selected Charts

- Cell Phone Built-in Memory Development
- Development Trend of Cell Phone Memory Configuration, 2007-2012E
- NAND+RAM Cell Phone Memory Capacity, 2007-2012E
- NOR+RAM Cell Phone Memory Capacity, 2007-2012E
- Cell Phone Memory Market Size, 2007-2012E
- Market Shares of Key Cell Phone Memory Manufacturers, 2009
- Cell Phone Single-chip Memory Packaging Trend, 2007-2010
- SIP Cell Phone Memory Packaging Trend, 2007-2011
- PoP Cell Phone Memory Packaging Trend, 2007-2011
- SSD Distribution by Downstream Application, 2008-2012
- Global Cell Phone Shipment by Region, 2007-2009Q2
- Market Shares of Key Mainland China Cell Phone Manufacturers, 1H2009
- China Cell Phone Export Volume, 1999-2008
- China Cell Phone Export Value, 2002-2008
- Monthly Shipment and Average Price, Jan-Dec, 2008
- Nokia Cell Phone Shipment by Region, 2007Q1-2009Q3
- Nokia Cell Phone Shipment and Average Selling Price, 2007Q1-2009Q3
- Nokia Cell Phone Shipment and Operating Profit Margin, 2007Q1-2009Q3
- Nokia Quarterly Cell Phone Shipment in China, 2006Q1-2009Q3
- Supply Ratio of Nokia Memory Suppliers, 2009
- Supply Ratio of Motorola Cell Phone Memory Suppliers, 2009
- Samsung Cell Phone Shipment and Growth Margin, 2001-2008
- Samsung Quarterly Cell Phone Shipment, 2006Q1-2009Q3

- Samsung Cell Phone Average Export Price and Operating Profit Margin, 2006Q1-2009Q3
- Supply Ratio of Samsung Cell Phone Memory Suppliers, 2009
- Sony Ericsson Shipment and Average Selling Price, 2006Q1-2009Q3
- Sony Ericsson Revenue and Operating Profit Margin, 2006Q1-2009Q3
- LG Cell Phone Shipment and Annual Growth Margin, 2001-2008
- LG Quarterly Cell Phone Shipment by Network Format, 2007Q1-2009Q3
- LG Quarterly Cell Phone Sales and Operating Profit, 2007Q1-2009Q3
- LG Cell Phone Revenue by Region, 2007Q1-2009Q3
- LG Sales and Average Price, 2007Q1-2009Q3
- Supply Ratio of LG Cell Phone Memory Suppliers, 2009
- HTC Revenue by Region, 2006-2008
- HTC Shipment and Average Selling Price, 2008Q1-2009Q2
- HTC Revenue and Annual Growth Rate, 2008Q1-2009Q2
- Market Shares of Main China's Cell Phone Memory Manufacturers, 2009
- Samsung's Cell Phone Memory Development Roadmap
- Macronix Revenue and Gross Profit Margin, 2003-2010E
- Macronix Quarterly Gross Profit Margin, 2007Q1-2009Q2
- Macronix Revenue by Division, 2008Q2-2009Q1&Q2
- Macronix Shipment by Division, 2008Q2-2009Q1&Q2
- Macronix Revenue by Technology, 2008Q2-2009Q1&Q2
- Macronix Revenue by Region, 2008Q2-2009Q1&Q2
- Macronix 8-inch Wafer Shipment and Average Capacity Utilization Ratio, 2004Q1-2009Q2
- Macronix ROM Shipment, 2004Q1-2009Q2
- Macronix FLASH Shipment, 2004Q1-2009Q2
- Macronix FLASH Revenue by Technology, 2008Q1-2009Q2

- Macronix NOR FLASH Distribution by Downstream Application, 2009Q2
- Inotera Revenue and Gross Profit Margin, 2004-2010
- Inotera Revenue and Gross Profit Margin, 2008Q1-2009Q3
- Inotera Capital Expenditure and Usage, 2003-2009
- HYNIX Revenue by Product, 2008Q1-2009Q3
- HYNIX Revenue and Gross Profit Margin, 2008Q1-2009Q3
- HYNIX Revenue by Product, 2009Q1-2010Q4
- HYNIX Revenue and Gross Profit Margin, 2005-2010
- HYNIX's Cell Phone MCP Decoding by Type
- ELPIDA Revenue by Division, FY2005 - FY2009
- ELPIDA Plants by Process, 2006-2009
- ELPIDA Roadmap
- Toshiba Revenue and Operating Profit, FY2005-FY2011
- Toshiba Revenue by Division, FY2007-FY2012
- Toshiba Semiconductor Revenue by Product, FY2008 -FY2010
- Toshiba Revenue by Product, 2005-2009
- Toshiba Semiconductor Investment by Field, FY2003-FY2009
- Spansion Revenue and Gross Profit Margin, 2004-2009
- Spansion Revenue by Division, 2007Q1-2008Q3
- Spansion EBITDA and Gross Profit Margin, 2007Q1-2008Q3
- Spansion Expenditure Ratio, 2007-2008Q3
- Spansion Global Presence
- Spansion Production Technology Structure, 2006-2008
- FAB25 Plant Production Technology Roadmap
- SP1 Plant Production Technology Roadmap
- Spansion Cost Estimation



- MICRON Revenue and Gross Profit, FY2004-FY2009
- MICRON Revenue and Gross Profit Margin, 2007Q1-2009Q3
- MICRON Revenue by Product, 2005FY-Sep, FY2009
- Winbond Revenue and Gross Profit Margin, 2006-2010
- Winbond Revenue and Gross Profit Margin, 2008Q1-2009Q3
- Winbond Memory by Process, 2008Q1-2009Q1
- Winbond Revenue by Product, Q2-Q3, 2009
- SST Revenue and Gross Profit Margin, 2003-Sep, 2009
- SST Revenue by Region, 2005-Sep, 2009
- SST Revenue by Downstream Application, 2008Q1-2009Q3
- Etron Revenue and Gross Profit Margin, 2001-2010
- ESMT Revenue and Gross Profit Margin, 2001-2009
- NAND Control IC Manufacturers
- Ranking of Global Cell Phone Brands by Shipment, 2007-1H2009
- Top 14 China's Cell Phone Manufacturers by Output, 1H2008-1H2009
- Top 32 China's Cell Phone Manufacturers by Export Volume, 1H2008-1H2009
- Nokia South and North Export Volume, 2007, 2008 & 1H2009
- Nokia South and North Output, 2007, 2008 & 1H2009
- Memory Configuration of Nokia's 50 Models
- Motorola Export Volume and Output in China, 2007, 2008 & 1H2009
- Memory Configuration of Motorola's 15 Models
- Export Volume and Output of Tianjin Samsung, Huizhou Samsung and Samsung Kejian, 2007, 2008 & 1H2009
- Memory Configuration of Samsung's 31 Models

- Song Ericsson Export Volume and Output in China, 2007, 2008 & 1H2009
- Song Ericsson Cell Phone Platform
- Export Volumes of LG Yantai and Qingdao, 2007, 2008 & 2009
- Parts Configuration of LG's 13 Models
- Memory Configuration of HTC's 11 Models
- Memory Configuration of China's 50 Cell Phone Models
- Profile of Macronix's Departments
- Intel Flash Memory Property
- STM's Memory Products for Cell Phone
- Toshiba's MCP Products for Cell Phone



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