



Cell Phone Memory Industry Report, 2009

Nov/2009



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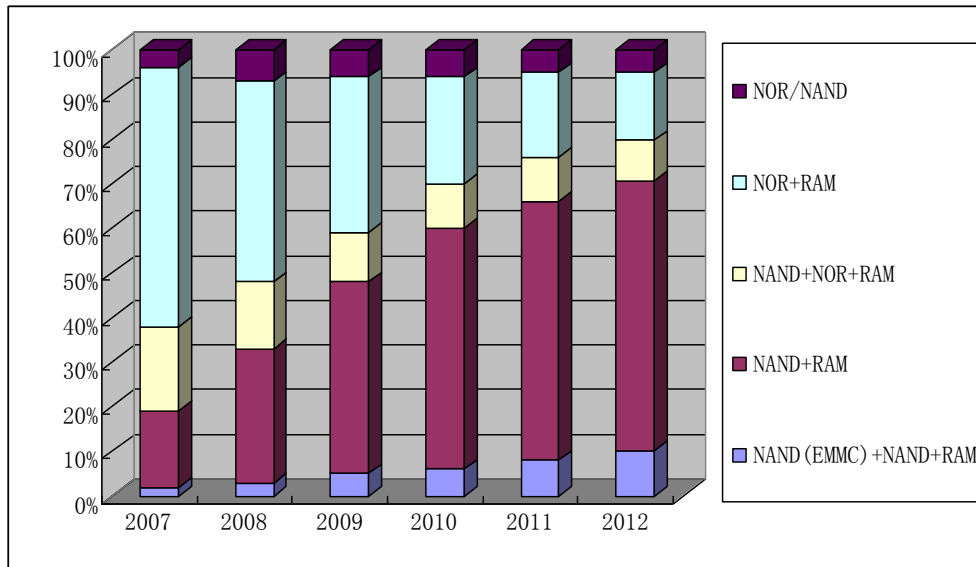
1.2 Cell Phone Memory Development

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.

Presently, all smart phones are provided with NAND+RAM memory, and approximately 60% of high-end cell phones also adopt NAND+RAM memory. 80% of super low-end cell phones are configured with NOR memory, and 70% of medium- and low-end cell phones are used with NOR+RAM memory. In the future, the medium- and high-end cell phones will also utilize the NAND+RAM memory.

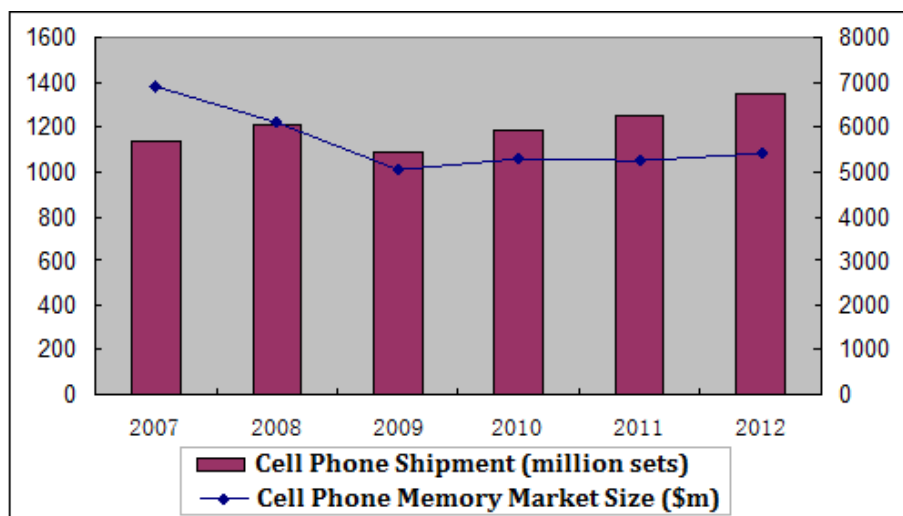
Development Trend of Cell Phone Memory Configuration, 2007-2012E



	2007	2008	2009	2010	2011	2012
NAND(eMMC)+NAND+RAM	2%	3%	5%	6%	8%	10%
NAND+RAM	17%	30%	43%	54%	58%	60%
NAND+NOR+RAM	19%	15%	11%	10%	10%	9%
NOR+RAM	58%	45%	35%	24%	19%	15%
NOR/NAND	4%	7%	6%	6%	5%	5%

1.3 Market & Industry

Cell Phone Memory Market Size, 2007-2012E



	2007	2008	2009	2010	2011	2012
Cell Phone Shipment (million sets)	1140	1213	1091	1185	1250	1350
Cell Phone Memory Market Size (\$M)	6894	6085	5037	5273	5250	5395

Although the capacity of cell phone memory will increase considerably by 50% or several times in the future, the prices of memory decline faster, in addition, memory capacity is not proportional to the price. In particular, the high-priced NOR flash memory retreats from the market gradually. The market scale of cell phone memories will not increase. Yet, the cost of cell phone memory drops a lot at the same time. Besides, there is high threshold for cell phone memory, and the manufacturers can still enjoy high profitability.

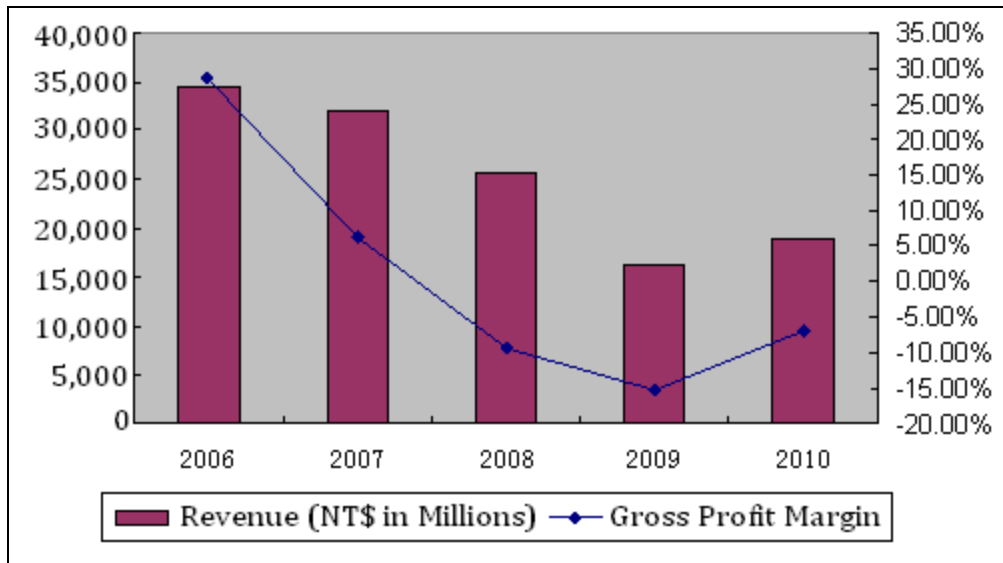
4.11 Winbond

Established in Sep, 1987, Winbond was affiliated to Sintra, and it had three divisions, DRAM, flash memory and logic IC in early stage. In Jul, 2008, the logic IC division separated, Nuvoton Technology Corp founded.

Its performance continued to decline in 2008, and its main partner, Qimonda, announced bankruptcy in Jan, 2009. Winbond revenue amounted to NTD25.6 billion in 2008, down 22% year-on-year, and post-tax loss was NTD7.36 billion.

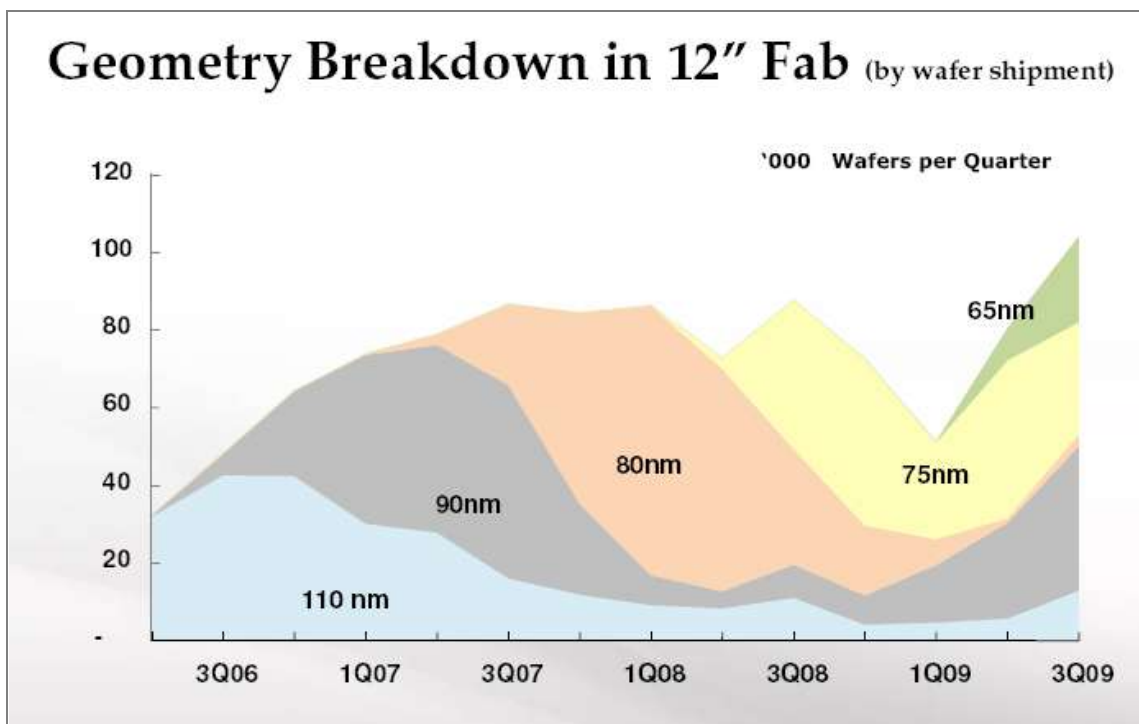
With more than 5,000 employees all over the world, Winbond has one 12-inch wafer plant, two 8-inch wafer plants, and one 6-inch wafer plant. On Mar 22, 2007, Winbond announced that it sold 8-inch wafer plants to Vanguard International, and the assets were transferred on Jan 1, 2008. Currently, the memory products all come from 12-inch wafer plants, and the monthly output capacity reaches 30,000 units.

Winbond Revenue and Gross Profit Margin, 2006-2010

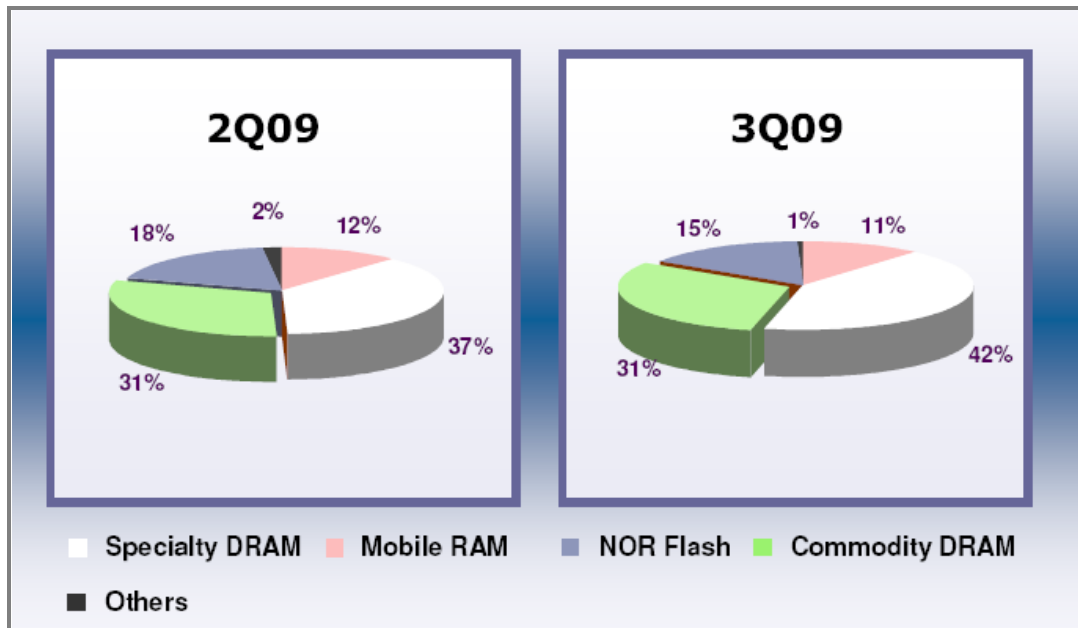


	2006	2007	2008	2009	2010
Revenue (NTD1 mln)	34488	32104	25616	16229	18921
Gross Profit Margin	28.5%	6.2%	-9.5%	-15.2%	-7.0%

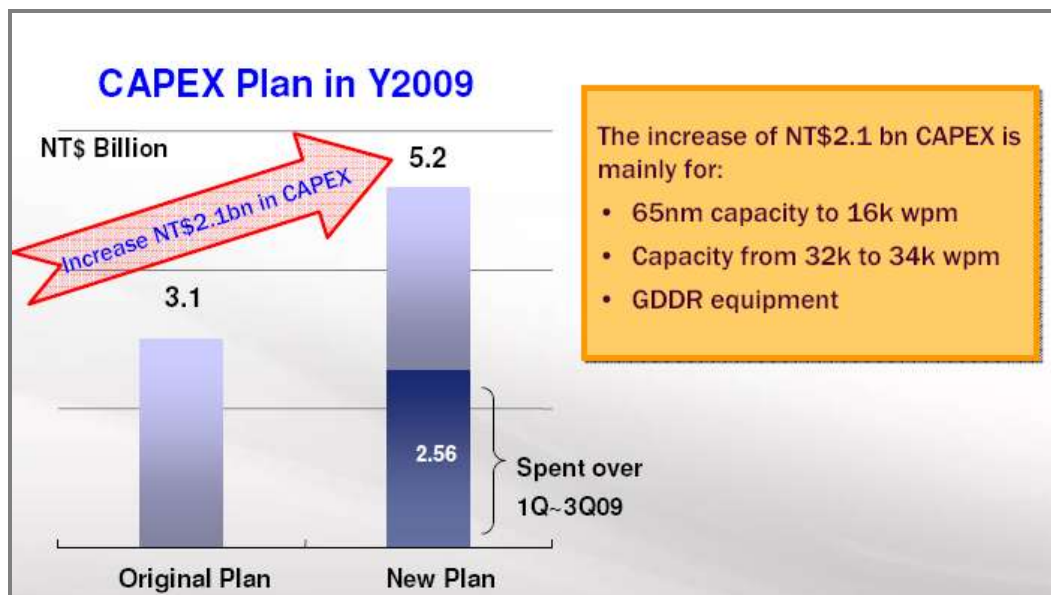
Winbond Memory by Process, 2008Q1-2009Q1



Winbond Revenue by Product, Q2-Q3, 2009



Winbond Investment Plan in 2009



It has actively developed Mobile RAM, and it launched Low Power DRAM to satisfy the requirements of portable video electronics products for a memory solution with high power and low consumption. The high performance and stability of SDRAM and Pseudo SRAM have won high reputations. It continued to work with international manufacturers to maintain good cooperative relations in memory IC products manufacturing field.

12" DRAM Wafer Fabrication Service

Wafer Size	Process	Technology	Type	Status*
300mm	Trench DRAM	90nm	Commodity	P
			LP	
300mm	Stack DRAM	65nm	Commodity	P
			LP	UD

* Status: P= Mass Production, S=Samples, UD=Under Development, UD (Time)= Under Development(Ready Time), EOL=End of life.

The memory mainly includes medium- and low-density NOR Flash, and Parallel Flash and Serial Flash products have perfect distribution, plus the process technology development, the products have become more competitive.

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