

**Global and China Memory Industry Report,
2014-2015**

May 2015

STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Global and China Memory Industry Report, 2014-2015 covers the followings:

1. Memory technology trends
2. Memory market
3. Memory industry
4. 19 typical memory industry chain vendors

After two years of recession, the global memory market went forward by leaps and bounds in 2013-2014, with scale up more than 20% for two consecutive years i.e. 20.5% in 2013, 22.1% in 2014, the highest growth rate among all semiconductor products. In 2015, the growth rate slows evidently, only 2.3%, and the memory market size is expected to reach USD83.8 billion.

Causes for the decline in growth rate are the followings. The first comes to the falling prices of DRAM. DRAM price began to rise from October 2012, a trend lasting till June 2014, resulting in increased supply and a balance between supply and demand. However, spot prices of DRAM started falling in July 2014.

Memory Industry Chain

	Vendor Representatives
Memory Die	Samsung, SK Hynix, Micron, Macronix
Memory Chip Package and Test	PTI, FATC, ChipMOS, Walton
Memory Modules	Kingston, ADATA, Ramaxel, Crucial, Smart Modular, Phison
Memory Design	ESMT, Etron, ISSI
Memory Foundry	SMIC, HHGRACE, UMC

Memory Vendor Rankings by Revenue, 2013-2015 (USD mln)

	2013	2014	2015E
SAMSUNG	21,653	27,844	30,331
HYNIX	13,379	16,264	18,544
MICRON	11,918	16,278	18,026
TOSHIBA	7,316	6,966	7,098
SANDISK	5,692	6,076	6,118
INOTERA	1,982	2,718	2,616
INTEL	2,013	2,178	2,016
NANYA	1,579	1,617	1,683
MACRONIX	746	738	746
WINBOND	1,113	1,251	1,395
CYPRESS	339	348	1,088
SPANSION	645	630	

Second, the demand dropped. Smartphone growth slowed down, the shipment of tablet PC dived and that of desktop PC fell as well. As the world is just stuck in an ill-defined “economic recovery”, China’s economy has seen a slowdown in growth rate, with a sharper decline to occur in its demand in 2016, and so will smartphones then. With the commissioning of new capacities of major memory vendors, especially in the NAND field, the price will fall more than expected. The memory industry will probably suffer another recession in 2016, down 3.1%.

The memory industry can be divided into two camps: South Korean camp and Japanese/American/Taiwanese camp. Taiwan has good scientific research base, enjoying a sound relationship with Japan; technologically supported by the latter for a long time, Taiwan has the most complete industry chain of memory, especially in packing & testing, it sometimes helps South Korean peers. Japan boasts the most advanced technology but lacks strong financial support, mostly in association with US companies, and the two are willing to cooperate with Taiwanese companies. Japan, the United States and Taiwan formed an alliance – Toshiba with SanDisk, and Micron with Formosa Plastics. South Korean vendors still fade next to Japanese ones e.g. Samsung pays an about 3% patent fee to Toshiba each year, but they are competitive in financial strength and production technology.

Mainland China has been the world’s largest memory market, annually importing memory worth tens of billions of dollars from South Korea. China is trying to change this situation but beset with difficulties. The basic industry and basic scientific research strength are relatively backward in Chinese Mainland, even falling behind Taiwan by more than 10 years in field of semiconductor. Since the rate of return on industry is far lower than the monetary speculation, companies in the mainland are keen on capital operation instead of industrial investment. Chinese mainland enterprises may have some achievements in NorFlash sector from which large companies have retreated, but it is hard to make a big breakthrough in DRAM and NAND.

Currently, most of the new technical memories have low capacity, or else they may face bottlenecks of high costs and poor reliability when capacity is raised. It is projected that traditional DRAM and NAND will still occupy the dominant position from 2020 to 2025, NorFlash or SRAM may be replaced by new technologies in the low-capacity memory field. STT-MRAM now moves up fastest in commercialization. Everspin had shipped 40 million STT MRAM before October 2014. Since then, it worked with GlobalFoundries in making STT MRAM (40 nm technology).

Intel, IBM, Samsung, SK Hynix and Qualcomm are developing MRAM storage technology while Japanese companies are pretty competitive in this area. In addition to Toshiba, TDK is also an important participant who showcased MRAM wafer with practical performance demonstration at CEATEC JAPAN for the first time.

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- 1.1 TLC
- 1.2 3D NAND
- 1.3 Emerging NVM

2. Memory Market

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- 2.3 NAND Supply & Demand
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- 2.5 China Mobile Phone Market
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- 2.7 Tablet PC Market
- 2.8 Server
 - 2.8.1 Server Market
 - 2.8.2 Server Industry
- 2.9 Enterprise SSD Market

3. Memory Industry

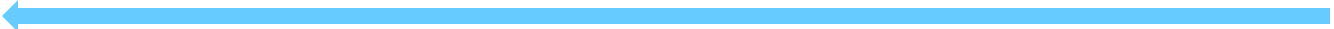
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