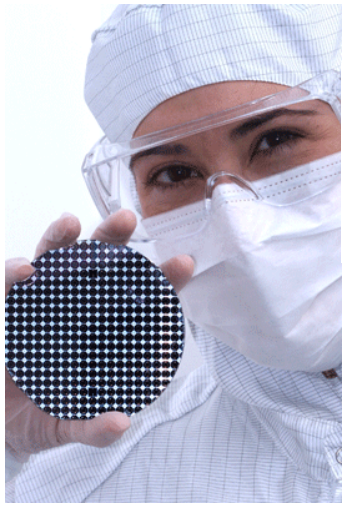
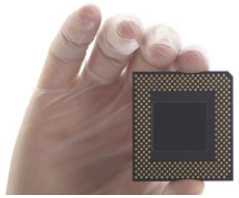
Semiconductor Trends In Taiwan and China





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Semiconductor Industry Trend

The semiconductor industry is experiencing unprecedented challenges, changes and opportunities

Semiconductor Trends (Continued)

Trend #1: As Moore's law continues to evolve, wafer demand for certain applications may be decreasing, instead of increasing

Trend: #2: The number of applications that can make use of the most advanced technologies are limited and decreasing

Semiconductor Trends (Continued)

Trend #3: Investment for advanced technologies becomes more and more expensive. Most of IDMs have adopted fab-lite strategy

Trend #4: Process technology development is slowing down due to uncertainties involving new materials

Semiconductor Trends (Continued)

Trend #5: "Moore's Law will hit a wall in ten years."

– Gordon Moore, 2007

Trend #6: IC design companies start to skip nodes because of increasing product complexity and tremendous efforts for IP preparation

Semiconductor Trends (Continued)

Trend #7: Design companies must be more innovative. Following Moore's Law is not necessarily the only winning solution

Trend #8: There is too much over-capacity for all technologies, mature and advanced. Consolidation should have happened. However, external constraints and internal egos make it difficult

DRAM Revenue

$USD M
Data source: Gartner Apr. '09

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	Market Share (%)	YoY (%)
1	1	Samsung	$8,700	$7,287	29.9%	-16.2%
2	2	Hynix	$6,720	$4,685	19.2%	-30.3%
4	3	Elpida	$3,708	$3,450	14.2%	-7.0%
5	4	Micron	$3,072	$2,458	10.1%	-20.0%
3	5	Qimonda	$3,959	$2,316	9.5%	-41.5%
6	6	Nanya	$1,479	$1,013	4.2%	-31.5%
7	7	Powerchip	$1,204	$919	3.8%	-23.7%
8	8	ProMOS	$965	$768	3.2%	-20.4%
9	9	Toshiba	$519	$462	1.9%	-11.0%
10	10	Etron	$348	$186	0.8%	-46.6%
		Total Market	$31,848	$24,356	100%	-23.5%

Flash Memory Revenue

$USD M
Data source: Gartner, Apr. '09

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	Market Share (%)	YoY (%)
1	1	Samsung	$6,970	$5,621	30.3%	-19.4%
2	2	Toshiba	$3,298	$3,152	17.0%	-4.4%
4	3	Spansion	$2,086	$1,989	10.7%	-4.7%
NA	4	Numonyx	NA	$1,906	10.3%	NA
6	5	Sandisk	$1,774	$1,619	8.7%	-8.7%
3	6	Hynix	$2,380	$1,325	7.1%	-44.3%
7	7	Micron	$1,177	$1,289	7.0%	9.5%
5	8	Intel	$1,800	$598	3.2%	-66.8%
11	9	Macronix	$282	$295	1.6%	4.6%
10	10	SST	$387	$249	1.3%	-35.7%
		Total Market	$22,265	$18,543	100%	-16.7%

Top 4 Wafer Foundry Comparison

$USD M

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	2007 Market Share (%)	2008 Market Share (%)
1	1	TSMC	$9,880	$10,628	61%	64%
2	2	UMC	$3,269	$2,982	20%	18%
4	3	Chartered	$1,458	$1,743	9%	10%
3	4	SMIC	$1,550	$1,360	10%	8%

Wafer Foundry Comparison During the Economic Meltdown

Q1 2009 Top Four Wafer Foundries

$USD M

Company	Revenue	Profit	Market Share (%)	Utilization (%)
TSMC	$1,168	$47	62%	40%
UMC	$319	($241)	17%	30%
Chartered	$244	($99)	13%	38%
SMIC	$146	($178)	8%	30%

Wafer Foundry Comparison During the Economic Meltdown

Q2 2009 Top Four Wafer Foundries

$USD M

Company	Revenue	Profit	Market Share (%)	Utilization (%)
TSMC	$2,195	$774	62.7%	85%
UMC	$690	$47	19.7%	79%
Chartered	$349	($39)	9.97%	60%
SMIC	$267	($98)	7.6%	60%

Global Fabless Revenue

$USD M
Data source: GSA

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	Market Share (%)	YoY (%)
1	1	Qualcomm	$5,619	$6,477	13%	15%
2	2	Broadcom	$3,744	$4,563	9%	22%
4	3	Marvell Group	$2,830	$3,007	6%	6%
3	4	Nvidia	$3,113	$2,897	6%	-7%
5	5	Mediatek	$2,429	$2,843	6%	17%
6	6	Xilinx	$1,809	$1,906	4%	5%
7	7	LSI	$1,706	$1,760	4%	3%
8	8	Altera	$1,264	$1,367	3%	8%
>10	9	Himax Technology	$918	$833	2%	-9%
>10	10	Novatek	$1,103	$797	2%	-28%

Top 10 Taiwan Fabless Design Companies

$USD M
Data source: TSIA

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	YoY (%)
1	1	Mediatek	2,472,017	2,754,528	11.4%
3	2	Himax	918,211	832,799	-9.3%
2	3	Novatek	1,110,624	797,583	-28.2%
4	4	Phison	622,909	574,548	-7.8%
5	5	Realtek	483,087	510,198	5.6%
6	6	Via	450,338	241,532	-46.4%
7	7	Etron	406,488	230,349	-43.3%
11	8	Richtek	186,562	207,462	11.2%
13	9	Sitronix	173,831	195,065	12.2%
16	10	Radium	127,560	193,184	51.4%

Top 10 China Fabless Design Companies

$USD M
Data source: CSA

2007 Rank	2008 Rank	Company	2007 Revenue	2008 Revenue	YoY (%)
2	1	Hisilicon	189.7	455.0	239%
1	2	China Integrated Circuit	214.8	212.2	-1.2%
4	3	Datang Micro	158.7	122.9	-22.5%
7	4	Hanzou Silan	120.6	119.4	-0.0%
5	5	Actions	129.1	99.7	-22.8%
7	6	Wuxi China Resource	125.0	91.8	-26.6%
8	7	Vimicro	103.8	91.5	-11.8%
9	8	Huahong	100.4	90.3	-10.0%
10	9	Tongfang Micro	67.2	58.4	-13.1%
NA	10	NEC China	?	41.5	?%

SWOT Analysis for China

Strength

- Global money influx
- Building industry clusters
- Land and labor costs
- Return of Silicon Valley expatriates
- Huge pool of engineering talent
- Strong government support

Weakness

- SOC design capability
- Lagging process technologies
- Lagging yield rate & stability
- Managerial skills
- Inexperienced engineers
- Marketing capability

SWOT Analysis for China

Opportunities

- Setting domestic standards
- Growing domestic fabless

Threats

- IP legal issues
- Global competition
- Investment return

SWOT Analysis for Taiwan

Strength

- Industry started in 1980
- Return of Silicon Valley expatriates
- Skillful engineers and seasoned management
- Labor cost still competitive
- Outstanding execution demonstrated by leader players

Weakness

- Many companies still compete in “me too” products
- Lack of marketing experts due to OEM mindset
- Still far behind in analog/mixed signal designs
- Lack of fundamental researches

SWOT Analysis for Taiwan

Opportunities

Huge room for catching up in analog/mixed signal design

Well positioned for pursuing green energy opportunities

Threats

"Chicken Head vs. Bull Tail" – M&A is difficult in Taiwan

Chinese fabless can be long-term threats

Chiwan Opportunities

- China has large system companies such as Huawei, Datang, etc
- China has more experts in RF and analog design, especially at system level
- China has a large pool of well educated engineers
- Taiwan, in general, has more experienced managers and engineers
- Two sides can compliment each other – Chiwan Opportunities
- The improving political atmosphere is favorable for closer cooperation
- Foundries should consolidate

Top 10 Semiconductor Suppliers – Which ones will rule in 2018?

Data source: Garter Dataquest, iSuppli

Rank	1978	1988	1998	2008
1	TI	NEC	Intel	Intel
2	Motorola	Toshiba	NEC	Samsung
3	NEC	Hitachi	Motorola	Toshiba
4	Hitachi	Motorola	Toshiba	TI
5	Philips	TI	TI	ST
6	Toshiba	Intel	Samsung	Renesas
7	National	Fujitsu	Hitachi	Sony
8	Fairchild	Mitsubishi	Philips	Qualcomm
9	Intel	Matsushita	ST	Hynix
10	Siemens	Philips	Infineon	Infineon

Questions

- Will Moore's Law hit a wall in ten years? What are the implications to the industry when that happens?
- Why can Korean companies lead in memory products, but not in logic ICs or foundries?
- Will Silicon Valley still be relevant?"

Thank You!