Overview on

Taiwan Semiconductor Industry

(2011 Edition)

Taiwan Semiconductor Industry Association

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I. Preface

This ***Overview on Taiwan Semiconductor Industry*** is a translated excerpt from an ITIS (Industrial Technology Information Services) publication, which provides an overview of Taiwan semiconductor industry in 2010. Also included is a directory of Taiwan semiconductor companies. These data should be valuable to those who wish to establish business relationship in Taiwan.

ITIS is a market research project, which is supported primarily by the Taiwan government. For semiconductor portion of the project, research was conducted in Industrial Economics & Knowledge Center of Industrial Technology Research Institute (IEK/ITRI).

Since the establishment of the Electronics Research and Service Organization of the Industrial Technology Research Institute (ERSO/ITRI) in early 1970's and its successive spin-offs of UMC and TSMC in 1980's, the semiconductor industry in Taiwan has been growing at a very fast pace. Currently TSIA represents approximately 68% of worldwide IC foundry revenue, around 51% of worldwide package revenue, around 76% of worldwide testing revenue, around 24% of worldwide design revenue. As the industry gains significant role in the global market place, information about Taiwan semiconductor industry is desirable worldwide. TSIA hopes this ***Overview on Taiwan Semiconductor Industry*** will serve as a useful reference for our global friends who seek to establish a closer connection with Taiwan semiconductor companies. We welcome your comments.

II. Taiwan Semiconductor industry in Year 2010

Overview of the Year

Semiconductor industry revenue of Asia reached US$161.8 billion in 2010, up 35.3% from 2009. Whereas Taiwan semiconductor industry revenue increased 41.5%, better than the 32.7% growth of the global semiconductor market. Among all semiconductor sectors in Taiwan, testing and manufacturing revenue increased the most. Testing revenue increased 51.1% and manufacturing revenue increased 53.3%, with foundry up 39.9% and DRAM up 86%.

Taiwan semiconductor revenue (including design, manufacturing, packaging, and testing) totaled NT$1,768.6 billion, up 41.5% from 2009, with NT$454.8 billion in design, a 17.9% increase, NT$884.1 billion in manufacturing, a 53.3% increase, NT$297 billion in packaging, up 48.8%, and NT$132.7 billion in testing, up 51.5%.

Taiwan semiconductor product revenue reached NT$768 billion in 2010, up 38.6% from 2009 mainly contributed by the dramatic growth of DRAM market. Memory products increased to comprise 42.4%, up from the 33.6% of 2009. As a result, logic ICs and analog ICs decreased from 53.3% to 45.5% and 6.1% to 5.1%, respectively. Micro-device ICs remained flat at 7.0%. Information and consumer ICs remained the two largest application areas in 2010, comprising 53% (up 3.0%) and 31.1% (down 1.5%), respectively. Communication ICs decreased 1.4%.

Table 1　Major Indices for Taiwan IC Industry

(NT$B)

	2006	2007	2008	2009	2010	10/09 Growth
Industry Revenue	1,393.3	1,466.7	1,347.3	1,249.7	1,768.6	41.5%
IC Design	323.4	399.7	374.9	385.9	454.8	17.9%
IC Manufacturing	766.7	736.7	654.2	576.6	884.1	53.3%
Foundry	437.8	451.8	446.9	408.2	570.9	39.9%
IC Packaging	210.8	228.0	221.7	199.6	297.0	48.8%
IC Testing	92.4	102.3	96.5	87.6	132.7	51.5%
Product Revenue	652.3	684.6	582.2	554.3	768.0	38.6%
Domestic Sales (%)	39.1%	37.8%	36.9%	37.9%	39.6%	-
Domestic Market	611.4	574.7	463.7	439.2	797.4	81.6%

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

By the end of 2010, Taiwan Semiconductor industry consisted of 266 IC fabless design houses, 15 fabrication companies, 30 packaging houses, 37 testing houses, 7 substrate suppliers, 11 wafer suppliers, 3 mask makers, and 4 leadframes companies, etc. (Figure 1). The advantages of cost efficiency, flexibility, and speed resulted from the vertically integrated infrastructure and the industry cluster effect have made Taiwan IC industry highly competitive in the global market.　In 2010, the worldwide market share of Taiwan IC design houses was ranked number 2, foundry was number 1, and IC packaging and testing was number 1.

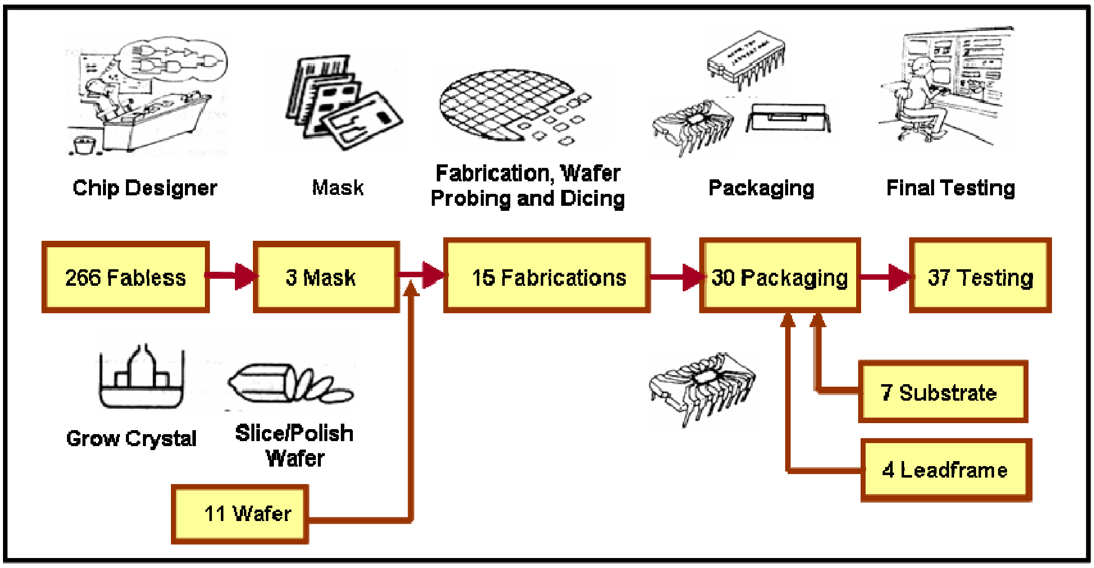

Fig. 1　Unique Disintegrated Infrastructure in Taiwan (2010)

IC Fabless Companies

Taiwan IC design revenue reached NT$454.8 billion in 2010, up 17.9% from 2009. Demand for PCs and notebooks was under expectation and that has weakened the information-related IC revenue. Communication ICs declined due to the intense competition from China in the 2G/2.5G handset chips despite the shipments of domestic high level 3G and smartphone chips increased. Consumer IC revenue enjoyed a high growth thanks to the demand for LCD TV, GPS, digital camera, STB, etc. The forecasted Taiwan IC design revenue in 2011 is NT$484.7 billion, a 6.6% growth from 2010.

1. Major Indices

In 2010, there were 266 design houses with revenue reached NT$454.8 billion (Table 2), which was 25.7% of the total Taiwan IC revenue (NT$1,768.6 billion per Table 1). Domestic sales comprised 33.3%. However, the growing demand from China is expected to increase the export ratio and result in a drop in import ratio to 32% in 2011. R&D expense increased to NT$72.77 billion in 2010, which represented 16% of total fabless revenue and is expected to grow to 17.5% in 2011.

Table 2 Major Indices of Taiwan IC Fabless Business

	2006	2007	2008	2009	2010	2011(e)
# of Companies	267	272	256	263	266	285
Revenue (NT$B)	323.4	399.7	374.9	385.9	454.8	484.7
Growth	13.5%	23.6%	-6.2%	2.9%	17.9%	6.6%
Domestic Sales	34.0%	33.0%	32.5%	33.5%	33.3%	32.0%
Capital Investment /Revenue	3.2%	3.3%	3.1%	3.0%	2.7%	2.5%
R&D/Revenue	10.8%	11.2%	12.6%	13.5%	16.0%	17.5%
Revenue per Workforce (NT$M)	9.2	11.3	11.3	11.6	11.9	12.1

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

2. Application Types

ASSP (Application Specific Standard Product) remained the major application type (Table 3), comprising 89.9% of all applications in 2010. ASIC (Application Specific Integrated Circuit) comprised 10.1%.

The strong market of consumer products such as iPad, iPhone, and iPod, and the intense price competition of information products have deteriorated the information applications (including ASSP and ASIC), the major application area, to drop to comprise 40.2%. Demand for handset chips from China was still strong. However, due to the intense competition in 2.0/2.5G handset chips from local IC makers in China and the product adjustments of Taiwan IC companies in 3G and smartphones, communication applications (including ASSP and ASIC) increased only slightly to 20.3%. Thanks to the trends of digital integration, consumer applications increased to 38%.

Table 3 Major Product Application of Taiwan IC Fabless Companies (%)

	ASIC				ASSP				Total
	Information	Communication	Consumer	Others	Information	Communication	Consumer	Others	
2006	2.0	1.3	7.8	0.0	38.0	15.4	33.5	2.0	100
2007	2.1	1.4	7.0	0.0	40.0	16.0	32.0	1.5	100
2008	2.1	1.4	6.5	0.0	40.3	17.0	31.3	1.4	100
2009	2.3	1.3	6.2	0.0	40.1	18.4	30.3	1.4	100
2010	2.1	1.8	6.2	0.0	38.1	18.5	31.8	1.5	100
2011(e)	2.3	1.6	6.0	0.0	39.2	19.3	30.4	1.2	100

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

3. Major Product Types

The expected growth of PC and notebooks in second half was deteriorated by the hot sale of iPad, iPhone, e-book, etc. It resulted in slower markets of driver ICs, controller ICs and I/O chips. Logic chips dropped to comprise 72.3%. Growing in the first half but price drop a little bit in the second half, memory revenue increased to comprise 10.1% in 2010 (8.8% in 2009). Analog ICs declined to 8.6% (8.8% in 2009) due to its saturating market and price competition from companies in China.

Table 4 Major Product Types by Taiwan IC Fabless Companies (%)

	Memory	Micro Component	Logic IC	Analog IC	Total
2006	10.6	7.9	73.4	8.1	100
2007	10.7	8.2	72.9	8.2	100
2008	9.5	8.8	73.1	8.6	100
2009	8.8	8.9	73.5	8.8	100
2010	10.1	9.0	72.3	8.6	100
2011(e)	9.6	8.5	73.0	8.9	100

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

4. Market Distribution

Due to Taiwan downstream system makers such as PC, NB, motherboard, handset makers actively set up production lines in China, China remained the largest market for Taiwan IC design companies, comprising 58%, up slightly from the 57.8% of 2009.

Table 5 Market Distribution for Taiwan IC Fabless Companies (%)

	Taiwan	HK/China	North America	Japan	South Korea	S-E Asia	Others	Total
2006	33.6	56.4	1.2	2.7	2.2	2.4	1.5	100
2007	32.9	56.7	1.4	1.4	2.8	2.5	2.1	100
2008	32.5	57.4	1.3	2.7	2.2	2.4	1.5	100
2009	32.8	57.8	1.5	2.5	2.0	2.1	1.3	100
2010	33.3	58.0	2.4	2.0	1.4	1.5	1.4	100
2011(e)	29.5	59.5	3.0	3.6	1.5	1.7	1.2	100

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

5. Top 10 Fabless Companies in Taiwan

Table 6 shows the top 10 Taiwan Fabless Companies in 2010. Mediatek and Novatek remained the top two, with NT$71.99 billion and 36.26 billion, respectively, in revenue. Morning Star, leading in China market in digital TV controller ICs, ranked the 3rd, with NT$33.66 billion in revenue. Most top 10 fabless companies enjoyed revenue growths in 2010 (Table 6).

Table 6 Top 10 Fabless companies in Taiwan, 2010

(NT$B)

2009 Ranking	2010 Ranking	Company	2009 Revenue	2010 Revenue	Growth
1	1	Mediatek	77.31	71.988	-6.9%
2	2	Novatek	27.00	36.261	34.3%
-	3	Morning Star	27.712	33.66	21.5%
3	4	Phison	24.46	31.796	30.0%
5	5	Realtek	20.27	22.271	9.9%
4	6	Himex	22.89	20.30	-11.3%
8	7	Richtek	8.03	11.618	44.7%
7	8	Global Unichip	8.27	10.271	24.2%
9	9	Raydium	7.81	9.172	17.4%
11	10	Etron	7.30	8.124	11.3%

Note: 2010 US$1=NT$31.6; 2009 US$1=NT$33

Source：ITIS Project, IEK-ITRI, TSIA (April 2011), Market Observation Post System

IC Fabrication

As of 2010, there were 14 IC wafer fabrication companies in Taiwan, including foundry companies such as tsmc, UMC, Vanguard, Episil, Mosel, ATC, and AMPI; IDMs such as Winbond and MXIC; and memory manufacturers such as Powerchip, Nanya, Inotera, Promos, and Rexchip.

The increased 40nm productions of foundry companies have helped the foundry revenue. Despite the market had been slowing down since the 3rd quarter, the growth in the first and second quarters still increased the DRAM revenue in 2010. As a result, 2010 Taiwan manufacturing revenue increased 53.3%.

Capital investment, mainly in 12-inch fab capacity expansion and process technology advancing, spiked 144.5%, reaching NT$330.34 billion, which represented 37.4% of total manufacturing revenue (higher than the 24.5% of 2009).

Table 7 Major Indices of Taiwan IC Fabrication Business

	2006	2007	2008	2009	2010	2011(e)
# of Companies	13	14	14	14	14	14
Revenue (NT$B)	766.7	736.7	654.2	576.6	884.1	962.7
Growth	30.5%	-3.9%	-11.2%	-11.9%	53.3%	8.9%
Domestic sales	41.0%	42.0%	44.0%	46.0%	45.0%	43.0%
Capital investment/ Revenue	36.5%	47.7%	26.4%	24.5%	37.4%	37.7%
R&D/Revenue	7.6%	8.6%	8.3%	8.7%	9.2%	9.3%
Average revenue per workforce (NT$M)	13.14	12.58	12.18	10.80	11.65	12.16

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

1. Top 10 IC Fabrication Companies in Taiwan

tsmc and UMC remained the top 2 IC fabrication companies in 2010 (Table 8). tsmc's revenue increased by 41.9%, reaching NT$419.5 billion (NT$295.7B in 2009). UMC's revenue increased 35.9%, reaching NT$120.4 billion (NT$88.6B in 2009). Revenue of Vanguard, the 3rd largest foundry in Taiwan, increased 27.4% to reach NT$16 billion (NT$12.6B in 2009).

The IDM companies, Winbond and MXIC, performed well after strategic adjustments of product lines and capacity. Winbond revenue reached NT$31.9 billion (up 63.1%) and MXIC reached NT$27.6 billion (up 4.5%).

The DRAM market kept growing in the first half of 2010 but was hit by the dramatic price drop in the end of the 3rd quarter. Revenue declined in the 4th quarter. Fortunately the strong growth in the first three quarters has helped the DRAM revenue. Powerchip revenue spiked 159.3% from NT$31.2 billion of 2009 to NT$80.8 billion in 2010, ranked the number 3 of the top 10 manufacturing companies in Taiwan. Number 4 to number 6 are also DRAM makers, Nanya, Maxchip, and Inotera.

Table 8 Top 10 Fabrication Companies in Taiwan, 2010

(NT$B)

2009 Ranking	2010 Ranking	Company	2009 Revenue	2010 Revenue	Growth
1	1	tsmc	2,957	4,195	41.9%
2	2	UMC	886	1,204	35.9%
5	3	Powerchip	312	808	159.3%
3	4	Nanya	425	565	33.2%
6	5	Maxchip	295	478	62.1%
4	6	Inotera	361	415	14.8%
8	7	Winbond	195	319	63.1%
7	8	MXIC	264	276	4.5%
10	9	Promos	100	225	124.0%
9	10	Vanguard	126	160	27.4%

Source: ITIS Project, IEK-ITRI, TSIA (April 2011)

2. Business Types

Taiwan Foundry, outgrew the worldwide semiconductor industry, increased 39.9% and accounted for 64.2% of Taiwan IC manufacturing revenue, down from the 69.8% of 2009. DRAM remained the major product type of Taiwan memory business and accounted for 31.4% of total Taiwan IC manufacturing revenue, down from the high level of 40.4% in 2006 but up from the 25.6% of 2009.

Table 9 Business Types of IC Fabrication in Taiwan (%)

	Business Type (by revenue)						
	Standard Product (including ASSP)				Customer Specific (ASIC)*	Foundry	Total
	Memory	Micro	Logic	Analog			
2006	40.4%	0.5%	2.0%	0%	0%	57.1%	100%
2007	36.2%	0.8%	2.3%	0%	0%	60.9%	100%
2008	32.4%	0.9%	2.6%	0%	0%	64.5%	100%
2009	25.6%	1.7%	2.9%	0%	0%	69.8%	100%
2010	31.4%	1.7%	2.7%	0%	0%	64.2%	100%
2011(e)	29.3%	1.8%	2.8%	0%	0%	66.1%	100%

*: Full Custom and Semi-Custom IC designed for specific customers.

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

3. Application Market

Communication application (especially wireless communication) was the largest application area of Taiwan foundry market in 2010, comprising 45.7%, down 1.1% from 2009 (46.8%). Thanks to the demand for cheap handsets in emerging markets and the demand for smartphones in developed markets, orders from new wireless communication designers and large communication ICs designers such as Qualcomm, Broadcom, and MediaTek increased. Information application, the second largest application area, accounted for 23.9%, down 3.7% (27.6% in 2009), with revenue mainly from the orders of large graphic IC designers such as nVidia and AMD. Consumer application accounted for 17.2% and is expected to be the driving force for foundry revenue growth due to the increasing demand for game consoles and digital TV, etc.

Table 10 Major Product Application of Taiwan Foundry Companies (%)

	Information	Communication	Consumer	Others	Total
2006	32.8%	42.9%	20.2%	4.1%	100%
2007	33.3%	41.8%	20.8%	4.2%	100%
2008	30.7%	40.6%	22.9%	5.8%	100%
2009	27.6%	46.8%	17.5%	8.1%	100%
2010	23.9%	45.7%	17.2%	13.2%	100%
2011(e)	29.3%	47.2%	15.3%	8.2%	100%

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

4. Geographical Market and Customers

North America remained the largest market for Taiwan foundry business in 2010, comprising 62.9% (Table 11). Domestic market, the second largest market, accounted for 18.2%. Asia-Pacific market is expected to grow due to the emerging China IC design business.

Table 11 Major Geographical Market for Taiwan Foundry Companies (%)

	Taiwan	North America	Europe	Japan	Asia Pacific	Others	Total
2006	21.0%	67.7%	6.1%	4.9%	0.2%	0.1%	100%
2007	21.0%	66.8%	6.9%	5.1%	0.1%	0.1%	100%
2008	18.6%	65.1%	10.2%	5.9%	0.1%	0.1%	100%
2009	17.6%	65.8%	10.2%	2.6%	3.6%	0.2%	100%
2010	18.2%	62.9%	11.1%	3.5%	4.1%	0.2%	100%
2011(e)	18.3%	62.3%	11.2%	3.7%	4.3%	0.2%	100%

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

IC Packaging

Thanks to the strong demand for handset and graphic chips in the first half, total packaging revenue grew by 48.8% to reach NT$297 billion in 2010, despite of the disadvantages of the low seasons and the NT dollar appreciation in the second half. Export ratio increased to account for 59% of total packaging revenue, mainly contributed by the growing outsourcing from IDMs that are focusing on core competiveness and cost down. Capital investment of Taiwan packaging companies increased dramatically in 2010 due to the economic recovery and the growing demand.

Table 12 Major Indices of Taiwan Packaging Industry

	2006	2007	2008	2009	2010	2011(e)
# of Companies	31	30	30	32	29	30
Revenue (NT$B)	210.8	228.0	221.7	199.6	297.0	327.7
Growth	18.4%	8.2%	-2.8%	-10.0%	48.8%	10.3%
Domestic sales	43.0%	42.0%	42.0%	44.0%	41.0%	40.0%
Capital Investment/ Revenue	18.2%	17.8%	13.5%	12.5%	19.0%	18.3%
R&D/Revenue	2.0%	2.2%	2.7%	2.9%	2.5%	2.5%
Average Revenue per workforce (NT$M)	3.40	3.34	3.52	3.41	4.13	4.20

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

1. Top 5 Packaging Companies

Table 13 shows the top 5 Taiwan packaging companies in 2010. Total revenue (NT$205 billion) of top 5 companies comprised 69% of total Taiwan packaging revenue (revenue of ASE group includes revenues from its overseas subsidiaries). Thus small companies are difficult to compete.

ASE and SPIL remained the top 2 packaging companies in Taiwan. Chipbond, majoring in the LCD driver IC packaging, grew the most by 151% and ranked the number 4.

Table 13 Top 5 IC Packaging Companies

(NT$B)

2009 Ranking	2010 Ranking	Company	2009 Revenue	2010 Revenue	Growth
1	1	ASE Group	67.93	101.07	48.8%
2	2	SPIL	53.21	58.28	9.5%
3	3	PTI	18.71	24.15	29.1%
9	4	Chipbond	4.44	11.14	151.0%
4	5	Chipmos	8.17	10.33	26.5%

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

2. Product Types and Market

BGA, with higher ASP, was the major packaging type of Taiwan packaging companies, comprising 48%. Flip Chip packaging increased due to the maturing applications of chipsets and graphic ICs used for handsets and the needs of system integration. The growth is expected to continue in 2011. QFP and TSOP used for optical storage and handset-related products accounted for 39.2%.

Table 14　Product Distribution by Domestic Revenue (%)

	DIP	SO*	QFP/PLCC	BGA/CSP	Bare Chip*	Others (including Bump)	Total
2006	0.5	18.2	16.3	51.0	9.3	4.7	100
2007	0.4	17.5	16.5	52.5	9.5	3.6	100
2008	0.4	15.5	17.5	53.7	9.1	3.8	100
2009	0.2	17.5	21.3	48.5	10.0	2.5	100
2010	0.4	18.1	21.1	48.0	10.2	2.2	100
2011(e)	0.4	17.5	18.3	51.1	10.5	2.2	100

1. SO*including SOJ/SOP/TSOP
2. Bare Chip* including TCP/COF/COG/Flip Chip/SiP/Stacked
Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

North America, outpaced Taiwan, became the major market of Taiwan packaging companies, comprising 41.5% of total Taiwan packaging revenue (Table 15) due to the economic recovery and the outsourcing from fabless companies and IDMs in this area. Orders from China have been increasing steadily. Fabless company was the major customer type, accounted for 55.6% of total packaging revenue. Orders from IDMs comprised more than 40%.

Table 15　Geographical Distribution of Packaging Revenue (%)

	Taiwan	North America	Japan	Europe	HK/China/ S-E Asia/Others	Total
2005	43.3	41.0	7.5	4.1	4.1	100
2006	43.4	41.3	7.2	3.9	4.2	100
2007	42.4	41.3	7.1	3.8	5.4	100
2008	42.2	41.5	7.0	3.9	5.4	100
2009	44.4	38.4	6.9	4.1	6.2	100
2010	40.8	41.5	7.3	4.0	6.4	100
2011(e)	40.0	42.0	7.5	4.1	6.4	100

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

3. Packaging Industry Development

Thanks to the outsourcing from IDMs, particularly from Europe and US, Taiwan packaging companies outperformed Taiwan foundries and IC design companies since the second half of 2010. Some Japanese IDMs such as Renesas, Kawasaki, Yamaha, etc. also increased outsourcing to Taiwan packaging companies due to the depreciation pressure of Japanese Yen. As for 2011, ASP, exchange rate, and gold price will be the three major challenges for Taiwan packaging companies. The IEK of ITRI estimated that 2011 Taiwan packaging revenue will reach NT$327.7 billion, a 10.3% growth from 2010.

IC Testing

As of 2010, there were 37 testing companies in Taiwan. Revenue reached NT$132.7 billion, a dramatic growth of 51.5% from 2009. Export increased slightly due to the recovery of memory market and the sales back to mother companies abroad. The growing outsourcing from IDMs in Europe, US, and Japan was also a contribution.

Capital investment of Taiwan testing companies has dropped to around 20% of total testing revenue. Most companies would only invest capital to meet the short-term demand and have been trying to increase the self-supply rate of testing equipment.

Table 16 Major Indices of Taiwan IC Testing Business

	2006	2007	2008	2009	2010	2011(e)
# of Companies	37	37	37	37	37	37
Revenue (NT$B)	92.4	102.3	96.5	87.6	132.7	147.4
Growth	36.9%	10.7%	-5.7%	-9.2%	51.5%	11.1%
Domestic sales	58.0%	57.0%	56.0%	58.0%	55.0%	54.0%
Capital Investment/ Revenue	25.3%	21.9%	16.8%	11.3%	18.5%	17.8%
R&D/Revenue	1.9%	2.0%	2.2%	2.5%	2.5%	2.5%
Revenue per Workforce (NT$M)	3.48	3.50	3.57	3.50	4.32	4.38

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

1. Top 5 Testing Companies

Revenue of the top 5 packaging companies accounted for around 45% of total testing revenue in 2010. ASE Group, revenue reached NT$22 billion, remained the number one in Taiwan testing business. Supported by Kingston and strategically allied with international companies such as Elpida, Toshiba, Powerchip and Hynix, PTI revenue grew 14.7%. ChipMOS, focusing on memory and LCD driver ICs, revenue increased 75.5% due to the price rise.

Table 17 Top 5 IC Testing Companies

(NT$B)

2009 Ranking	2010 Ranking	Company	2009 Revenue	2010 Revenue	Growth
1	1	ASE Group*	15.8	21.96	39.0%
3	2	KYEC	9.54	12.96	35.8%
2	3	PTI	11.11	12.75	14.7%
5	4	Chipmos	3.34	5.86	75.5%
4	5	SPIL	4.81	5.26	9.4%

*: including ASE Test and ASE Inc.

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

2. Product Types and Market

Memory (mainly DRAM and Flash) remained the major product in 2010 and accounted for 60% of total testing revenue. DRAM process technology has shifted to 50nm and capacity per chip has increased to 1Gb. DDR3 production has become the mainstream. Flash has become one of the major testing products due to the higher storage needs of smartphones, tablet PCs and digital cameras.

Domestic market remained the major market for the Taiwan testing business, comprising 55.4% of total testing revenue (Table 19). North America, the second largest market, accounted for 30%. Thanks to the economic recovery and outsourcing from international fabless companies and IDMs, orders from Europe, US, and Japan also increased slightly.

Table 18 Product Distribution by Domestic Revenue (%)

	Memory	Logic & Micro-component	Mixed Signal	Linear	RF	Others	Total
2006	59.9	21.3	16.4	0.2	1.1	1.1	100
2007	60.1	21.2	16.5	0.2	1.3	0.7	100
2008	53.1	24.9	18.2	1.2	1.7	0.9	100
2009	56.5	22.2	16.9	1.8	1.9	0.7	100
2010	60.0	21.3	16.5	0.3	1.3	0.6	100
2011(e)	59.0	22.5	16.3	0.3	1.3	0.6	100

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

Table 19 Geographic Distribution of Testing Revenue (%)

	Taiwan	North America	Japan	Europe	HK/China/ S-E Asia/Others	Total
2006	57.9	28.8	5.7	1.1	6.5	100
2007	57.4	28.8	5.6	1.2	7.0	100
2008	56.0	29.7	5.9	1.9	6.5	100
2009	58.3	28.0	5.4	1.4	6.9	100
2010	55.4	29.3	6.3	2.4	7.6	100
2011(e)	54.0	30.1	6.5	2.0	7.4	100

Source：ITIS Project, IEK-ITRI, TSIA (April 2011)

III. Taiwan IC Market

In 2010, Taiwan IC market reached NT$797.4 billion, an 81.6% growth from the NT$439.2 billion of 2009. Imported ICs increased 115.6% to NT$493.4 billion and exported ICs increased 136.4% to NT$1,056.8 billion. Major products included down-stream PCs, DRAM modules, internet and communication products, and LCD monitors, etc.

South Korea, comprising 24.6%, remained the largest importing region (mainly memory products including Flash and DRAM) for local demand (Table 20), followed by China, Malaysia, Japan, and Philippines.

Hong Kong was the largest exporting region, comprising 36%, followed by China (20.8%), Singapore (14.6%), and Japan (13.5%).

Table 20　Top 10 Import/Export Regions of Taiwan IC Market

(NT$B)

Import				Export			
Ranking	Country	Amount	Market Share	Ranking	Country	Amount	Market Share
1	South Korea	120.7	24.6%	1	Hong Kong	377.2	36.0%
2	China	94.7	19.3%	2	China	217.5	20.8%
3	Malaysia	45.8	9.3%	3	Singapore	152.4	14.6%
4	Japan	34.1	8.5%	4	Japan	141.0	13.5%
5	Philippines	27.4	5.6%	5	South Korea	38.2	3.6%
6	Thailand	20.4	4.2%	6	US	24.8	2.4%
7	Singapore	19.0	3.9%	7	Malaysia	21.7	2.1%
8	US	9.3	1.9%	8	Philippines	20.0	1.9%
9	Costa Rica	4.7	1.0%	9	Thailand	10.8	1.0%
10	Germany	2.5	0.5%	10	Netherlands	6.2	0.6%
	Others	104.4	21.3%		Others	36.7	3.5%
	Total	490.4	100.0%		Total	1,046.5	100.0%

Source：Taiwan Customs；ITIS Project, IEK-ITRI, TSIA (April 2011)

IV. Outlook

2011 Taiwan IC revenue is expected to reach NT$1,922.5 billion, an 8.7% growth from 2010. The estimated revenues for Taiwan IC market in 2012 and 2013 are NT$2,151.8 billion (up 11.9%) and NT$2,281.7 billion (up 6.0%), respectively.

V. Directory of Taiwan Semiconductor Companies

Fabless

5V Technologies
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FAX:886-2-27887366
www.5vtechnologies.com

AAT
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FAX:886-3-5633126
www.aatech.com.tw

ACARD
TEL:886-2-85122290
FAX:886-2-85122548
www.acard.com

Acute
TEL:886-3-5790680
FAX:886-3-5775606
www.acutecomm.com.tw

AIC
TEL: 886-3-5772500
FAX:886-3- 5772510
www.analog.com.tw

AIT
TEL:886-3-6560528
FAX:886-3-6565051
www.a-i-t.com.tw

AiT
TEL:886-2-26961202
FAX:886-2-26961201
www.ait-ic.com

Airoha
TEL: 886-3-6128800
FAX:886-3- 6116680
www.airoha.com.tw

Alchip Technologies
TEL: 886-2-27992318
FAX:886-2-26997389
www.alchip.com

Alcor Micro
TEL:886-2-26535000
FAX:886-2-26534000
www.alcormicro.com

AlfaPlus
TEL:886-3-5163270
FAX:886-3-5163267
www.alfaplus.com.tw

ALI
TEL:886-2-87522000
FAX:886-2-87511001
www.ali.com.tw

Alpha
TEL:886-3-5736660
FAX:886-3-5736661
www.ealpha.com.tw

Altus
TEL:886-2-77158888
www.altus-tech.com

Ambarella
TEL:886-3-6668828
FAX:886-3-6661282
www.ambarella.com

AMIC
TEL:886-3-5679966
FAX:886-3-5679977
www.amictechnology.com

AMICCOM
TEL:886-3-5785818
FAX:886-3-5785819
www.amiccom.com.tw

Ampson
TEL:886-3-5324129
FAX:886-3-5314935
www.ampson.com.tw

Amtek
TEL:886-2-29998989
FAX:886-2-29992929
www.amtek-semi.com

ANA
TEL:886-2-26558628
FAX:886-2-26558676
www.anatek.com.tw

AnaGlobe
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FAX:886-3-6661976
www.anaglobe.com.tw

ANDES
TEL:886-3-6668300
FAX:886-3-6668322
www.andestech.com

AnMO
TEL:886-3-5357868
FAX:886-3-5358098
www.anmo.com.tw

ANPEC
TEL:886-3-5642000
FAX:886-3-5642050
www.anpec.com.tw

AnSC
TEL:886-3-6669898
FAX:886-3-5632246
www.ansc.biz

APEC
TEL:886-3-5750576
FAX:886-3-5737701
www.a-power.com.tw

APLUS
TEL:886-2-27829266
FAX:886-2-27829255
www.aplusinc.com.tw

Arques Technology
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FAX:886-2-89131366
www.arquestech.com

ASIX
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FAX:886-3-5799558
www.asix.com.tw

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FAX:886-2-22196080
www.asmedia.com.tw

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FAX:886-3-5726280
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www.aspeedtech.com

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www.asuka-semi.com.tw

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FAX:886-2-82215489
www.8tec.com

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www.averlogic.com

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www.avid.com.tw

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FAX:886-3-6661301
www.avisonic.com

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FAX:886-3-5633761
www.aviqtech.com

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BSI
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www.bsi.com.tw

Capella
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FAX:886-2-82186602
www.capellamicro.com

CDT
TEL:886-2-22994908
FAX:886-2-22990133
www.cdt.com.tw

CFP
TEL:886-2-22231558
FAX:886-2-22233988
www.cfpt.com.tw

Champion
TEL:886-3-5679979
FAX:886-3-5679909
www.championmicro.com.tw

CHESEN
TEL:886-2-82265589
FAX:886-2-82265181
www.chesen.com.tw

Chingis
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FAX:886-3-5633696
www.chingistek.com

Chip Goal
TEL:886-3-5169219
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www.chipgoal.com.tw

Chip Hope
TEL:886-2-82271166
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www.chiphope.com.tw

CHIPMAST
TEL:886-3-5510580
FAX:886-3-5510860
www.chipmast.com.tw

CHiPLUS
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FAX:886-3-5637877
www.chiplus.com

Cion
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FAX:886-2-87732211
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FAX:886-3-6668670
www.crystalmedia.com.tw

CMSC
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FAX:886-3-5634863
www.cmsc.com.tw

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Conwise
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CTC
TEL:886-3-5311161
FAX:886-3-5338403
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FAX: 886-2-27311336
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ILITEK
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FAX:886-3-5600055
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Imagiatek
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FAX:886-2-26982188
www.imagiatek.com

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FAX:886-3-5785618
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FAX:886-3-6661339
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FAX:886-2-87913699
www.inno.com.tw

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IPwork
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FAX:886-3-5635089
www.ipworks.com.tw

ISSC
TEL:886-3-5778385
FAX:886-3-5778501
www.issc.com.tw

ISSI
TEL:886-3-5780333
FAX:886-3-5783000
www.issi.com

iSoft
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FAX:886-2-89131722
www.isoft.com.tw

IST
TEL:886-2-87977911
FAX:886-2-87977915
www.ist4u.com

ITE Tech. Inc.
TEL:886-3-5798658
FAX:886-3-5794803
www.ite.com.tw

Jeilin
TEL:886-2-82215466
FAX:886-2-82215456
www.jeilin.com.tw

Jmicron
TEL:886-3-5797389
FAX:886-3-5799566
www.jmicron.com

King Billion
TEL:886-3-5526168
FAX:886-3-5526188
www.kingb.com.tw

Kolorific
TEL:886-2-26558289
FAX:886-2-26558755
www.kolorific.com

KTC
TEL:886-3-5798608
FAX:886-3-5775640
www.ktc.com.tw

Leadtrend
TEL:886-3-5783588
FAX:886-3-5787288
www.leadtrend.com.tw

Legend Design
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FAX:886-3-6111889
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Linear-Artwork
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FAX:886-2-89131980
www.linear-artwork.com

Lionic
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www.lionic.com

Lyontek
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FAX:886-3-6668836
www.lyontek.com.tw

Macroblock
TEL:886-3-5790068
FAX:886-3-5797534
www.mblock.com.tw

MacroTech
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FAX:886-3-5785545
www.macrotechnic.com

Magellan Discovery
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FAX:886-2-87510399
www.magellandiscovery.com

Magic Pixel Inc.
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FAX:886-3-6668811
www.magicpixel.com.tw

MaxRise
TEL:886-3-6687667
FAX:886-3-6687662
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Mdtic
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Media Scope
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FAX:886-2-22286833
www.mstcweb.com

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FAX:886-3-5787610
www.mediatek.com.tw

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TEL:886-3-5750050
FAX:886-3-5750070
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MemoCom Corp.
TEL:886-3-5730808
FAX:886-3-5720518
www.memocom.com.tw

MEMSMART
TEL:886-3-5733463
FAX:886-3-5741077
www.memsmart.com.tw

METANOiA
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FAX:886-3-5776132
www.metanoia-comm.com

MICON
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FAX:886-2-26586184
www.mdtic.com.tw

MicroLinks
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FAX:886-7-6579561
www.vitiny.com

MicroMedia
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FAX:886-3-5641899
www.micromedia.com.tw

Mobile Devices
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FAX:886-3-5586582
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www.modiotek.com.tw

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FAX:886-2-87872284
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www.pgc.com.tw

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PRESCOPE
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TEL:886-2-66296288
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www.princeton.com.tw

Prolific
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FAX:886-2-26546161
www.prolific.com.tw

Quantek
TEL:886-2-29106186
FAX:886-2-29106336
www.quantek-inc.com

Rafael Microelectronics
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RAiO
TEL:886-3-5637888
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Ralink
TEL:886-3-5600868
FAX:886-3-5600818
www.ralinktech.com.tw

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TEL:886-2-87920777
FAX:886-2-87928686
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