TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD
Form 20-F
May 28, 2004
Table of Contents

As filed with the Securities and Exchange Commission on May 28, 2004

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

FORM 20-F

¨ **REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR 12(g) OF THE SECURITIES EXCHANGE ACT OF 1934**

OR

x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2003

OR

¨ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission file number 1-14700

(Exact Name of Registrant as Specified in Its Charter)

Taiwan Semiconductor Manufacturing Company Limited **(Translation of Registrant s Name Into English)**	**Republic of China** **(Jurisdiction of Incorporation or Organization)**

No. 8, Li-Hsin Road 6

Hsinchu Science Park

Hsinchu, Taiwan

Republic of China

(Address of Principal Executive Offices)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of Each Class	**Name of Each Exchange on Which Registered**
Common Shares, par value NT$10.00 each	The New York Stock Exchange, Inc.*

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None

(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

None

(Title of Class)

Indicate the number of outstanding shares of each of the issuer s classes of capital or common stock as of the close of the period covered by the annual report.

As of December 31, 2003, 20,266,618,984 Common Shares, par value NT$10 each were outstanding.

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨

Indicate by check mark which financial statement item the registrant has elected to follow. Item 17 ¨ Item 18 x

* Not for trading, but only in connection with the listing on the New York Stock Exchange, Inc. of American Depositary Shares representing such Common Shares

Table of Contents

TABLE OF CONTENTS

Taiwan Semiconductor Manufacturing Company Limited

		Page
CAUTIONARY STATEMENT FOR PURPOSES OF THE SAFE HARBOR PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995		1
GLOSSARY OF TECHNICAL TERMS		2
PART I		5
Item 1.	Identity of Directors, Senior Management and Advisors	5
Item 2.	Offer Statistics and Expected Timetable	5
Item 3.	Key Information	5
Item 4.	Information on the Company	16
Item 5.	Operating and Financial Reviews and Prospects	30
Item 6.	Directors, Senior Management and Employees	43
Item 7.	Major Shareholders and Related Party Transactions	51
Item 8.	Financial Information	54
Item 9.	The Offer and Listing	55
Item 10.	Additional Information	56
Item 11.	Quantitative and Qualitative Disclosures about Market Risk	69
Item 12.	Description of Securities Other than Equity Securities	71
Item 13.	Defaults, Dividend Arrearages and Delinquencies	71
Item 14.	Material Modifications to the Rights of Security Holders and Use of Proceeds	71
Item 15.	Controls and Procedures	71
Item 16A.	Audit Committee Financial Expert	71
Item 16B.	Code of Ethics	71
Item 16C.	Principal Accountant Fees and Services	71
Item 16D.	Exemptions from the Listing Standards for Audit Committees	72
Item 16E.	Purchases of Equity Securities by the Issuer and Affiliated Purchasers	72
Item 17.	Financial Statements	72
Item 18.	Financial Statements	73
Item 19.	Exhibits	73

Table of Contents

CAUTIONARY STATEMENT FOR PURPOSES OF THE SAFE HARBOR PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

Except for historical matters, the matters discussed in this Annual Report on Form 20-F are forward-looking statements that are subject to significant risks and uncertainties. Forward-looking statements include, but are not limited to, statements under the following headings: (i) Item 3. Key Information Risk Factors , about expansion plans, dedicated foundry revenues, the foundry segment, certain intellectual property rights and water supplies in the Hsinchu Science Park and Southern Taiwan Science Park; (ii) Item 3. Key Information Risk Factors , about our expectation as to the commencement of production at Fab 14 (Phase 1); (iii) Item 4. Information on the Company Industry Background , about the expected growth rate of the semiconductor industry and the dedicated foundry segment; (iv) Item 4. Information on the Company Our History and Structure , about expansion plans in mainland China and our expectation as to the commencement of production at Fab 10; (v) Item 4. Information on the Company Our Facilities , about our capacity expansion plans; (vi) Item 4. Information on the Company Manufacturing Capacity and Technology , about commercial production using 90-nanometer technology; (vii) Item 4. Information on the Company Capacity Expansion and Technology Upgrade Plans , about capacity expansion, capital expenditures, technological upgrades and commitments by customers for future capacity; (viii) Item 4. Information on the Company Markets and Customers , about our customer base; (ix) Item 4. Information on the Company Research and Development , about our plans to continue to invest significant amounts on research and development and the qualification of 90 nanometer process technology and the development of 65-nanometer process technology; (x) Item 4. Information on the Company Competition , about competition from semiconductor manufacturers; (xi) Item 4. Information on the Company Electricity and Water , about the Hsinchu Science Park and Southern Taiwan Science Park water supply; (xii) Item 5. Operating and Financial Reviews and Prospects Results of Operations Operating Expenses , about annual research and development expenditures; (xiii) Item 5. Operating and Financial Reviews and Prospects Income Tax Benefit (Expense) about additional valuation allowances for tax credits generated in 2003; (xiv) Item 5. Operating and Financial Reviews and Prospects Liquidity and Capital Resources about our depreciation and amortization expenses, capital expenditures and financing project expansion; (xv) Item 5. Operating and Financial Reviews and Prospects Taxation , about the tax exemption period for Fab 12 (Phase I); and (xvi) Item 5. Operating and Financial Reviews and Prospects US GAAP Reconciliation , about payment of employee bonuses with common shares. Please see Item 3. Key Information Risk Factors for a discussion of certain factors that may cause actual results to differ materially from those indicated by our forward-looking statements.

Table of Contents

GLOSSARY OF TECHNICAL TERMS

ASIC	Application Specific Integrated Circuit. A custom-designed integrated circuit that performs specific functions that would otherwise require a number of off-the-shelf integrated circuits to perform. The use of an ASIC in place of a standard integrated circuit reduces product size and cost and also improves reliability.
BiCMOS	Integrated circuit fabrication technology that produces both bipolar transistors and CMOS transistors and combines them on one chip.
Cell	A primary unit that normally repeats many times in an integrated circuit. For example, a cell represents a bit in a memory integrated circuit.
CIS	CMOS Image Sensor. A photodiode censoring circuit made by CMOS used in applications like digital camera, surveillance and securing systems. The direct competition is Charge-Coupled Devices (CCD) technology. CIS provides the advantage of lower cost, lower power consumption and integration with CMOS logic or mixed-signal processes.
CMOS	Complementary Metal Oxide Silicon. Currently the most common integrated circuit fabrication process technology, CMOS is one of the latest fabrication techniques to use metal oxide semiconductor transistors.
CVD	Chemical Vapor Deposition. A process in which gaseous chemicals react on a heated surface to form solid crystalline materials.
Die	A piece of a semiconductor wafer containing the circuitry of a single chip.
DRAM	Dynamic Random Access Memory. A type of volatile memory product that is used in electronic systems to store data and program instructions. It is the most common type of RAM and must be refreshed with electricity thousands of times per second or else it will fade away.
DSP	Digital Signal Processor. A type of integrated circuit that processes and manipulates digital information after it has been converted from an analog source.
EPROM	Erasable Programmable Read-Only Memory. A form of PROM that can be erasable using ultraviolet light, so that it can be reprogrammed.
Fabless semiconductor company	A class of semiconductor company that designs, tests, markets and sells semiconductors, but subcontracts wafer manufacturing to silicon wafer manufacturers.

Table of Contents

Flash memory	A type of non-volatile memory, similar to an electrically EPROM in that it is erasable and reprogrammable. The difference is that it can be erased and reprogrammed in the electronic system into which the flash memory chip has been incorporated.
Integrated circuit	A combination of two or more transistors on a base material, usually silicon. All semiconductor chips, including memory chips and logic chips, are very complicated integrated circuits with up to millions of transistors.
Logic device	A device that contains digital integrated circuits that process, rather than store, information.
Mask	A piece of glass on which an integrated circuit s circuitry design is laid out. Integrated circuits may require up to 20 different layers of design, each with its own mask. In the integrated circuit production process, a light shines through the mask leaving an image of the design on the wafer. Also known as a reticle.
Memory	A group of integrated circuits that are used to store data or programs, such as ROM, Flash RAM, DRAM and SRAM.
Micron	1/25,000 of an inch. Circuitry on an integrated circuit typically follows lines that are less than one micron wide.
MOS	A device which consists of three layers (metal, oxide and semiconductors) and operates as a transistor.
Nonvolatile memory	Memory products which retain their data content without the need for constant power supply.
Reticle	See Mask herein.
RISC	Reduced Instruction Set Computing. A type of processor architecture that processes programs more quickly than conventional micro processors because it uses a smaller, faster, less complex set of instructions.
Scanner	A machine used in the photolithography process in making wafers. A scanner, like a conventional stepper, aligns a small portion of the wafer with the mask upon which the circuitry design is laid out and exposes that portion of the wafer to a laser beam, transferring the circuit design on to the wafer. The machine then steps to the next area, repeating the process until the entire wafer has been completed. Exposing only a small area of a wafer at a time allows the laser to focus more intensely, which improves the resolution of the circuitry design. A scanner also combines this stepper technology with a photoscanning method that permits the exposure of a larger segment of the wafer than a stepper.

Table of Contents

SRAM	Static Random Access Memory. A type of volatile memory product that is used in electronic systems to store data and program instructions. Unlike the more common DRAM, it does not need to be refreshed.
Stepper	A machine used in the photolithography process in making wafers. A stepper aligns a small portion of the wafer with the mask upon which the circuitry design is laid out and then exposes that portion of the wafer to a laser beam, transferring the circuit design on to the wafer. The machine then steps to the next area, repeating the process until the entire wafer has been completed. Exposing only a small area of a wafer at a time allows the laser to focus more intensely, which improves the resolution of the circuitry design.
Transistor	An individual circuit that can amplify or switch electric current. This is the building block of all integrated circuits.
Volatile memory	Memory products which lose their data content when the power supply is switched off.
Wafer	A thin, round, flat piece of silicon that is the base of most integrated circuits.

Table of Contents

PART I

Item 1. Identity of Directors, Senior Management and Advisors

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

Selected Financial and Operating Data

The selected income statement data and cash flow data for the years ended December 31, 2001, 2002 and 2003, and the selected balance sheet data as of December 31, 2002 and 2003, set forth below, are derived from our audited consolidated financial statements included herein, and should be read in conjunction with, and are qualified in their entirety by reference to, these consolidated financial statements, including the notes to these consolidated financial statements. The selected income statement data and cash flow data for the years ended December 31, 1999 and 2000 and the selected balance sheet data as of December 31, 1999, 2000 and 2001, set forth below, are derived from our audited consolidated financial statements not included herein. The consolidated financial statements have been prepared and presented in accordance with the Republic of China (ROC or Taiwan) GAAP, which differ in some material respects from US GAAP. Please see note 28 to our consolidated financial statements for a description of the principal differences between ROC GAAP and US GAAP for the periods covered by these financial statements.

	Year ended and as of December 31,					
	1999	2000	2001	2002	2003	2003
	NT$	NT$	NT$	NT$	NT$	US$
	(in millions, except for percentages, earnings per share and per ADS, and operating data)					
Income Statement Data:						
ROC GAAP						
Net sales	76,305	166,198	125,885	162,301	202,997	5,972
Cost of sales[(1)]	(45,212)	(87,610)	(92,228)	(109,988)	(128,113)	(3,769)
Gross profit[(1)]	31,093	78,588	33,657	52,313	74,884	2,203
Operating expenses[(1)]	(8,823)	(17,293)	(20,879)	(20,724)	(23,583)	(694)
Income from operations	22,270	61,295	12,778	31,589	51,301	1,509

Non-operating income	1,619	6,120	6,476	2,350	5,669	167
Non-operating expenses	(3,261)	(3,513)	(8,467)	(6,717)	(5,791)	(170)
Income before income tax	20,628	63,902	10,787	27,222	51,179	1,506
Income tax (expense) benefit	2,383	1,167	3,740	(5,637)	(3,923)	(116)
Net income before minority interest	23,011	65,069	14,527	21,585	47,256	1,390
Minority interest in loss (income) of subsidiary	516	37	(44)	25	3	
Net income	23,527	65,106	14,483	21,610	47,259	1,390
Basic earnings per share[(2)]	1.38	3.29	0.69	1.05	2.33	0.07
Diluted earnings per share[(2)]	1.38	3.29	0.69	1.05	2.33	0.07
Basic earnings per ADS equivalent	6.88	16.47	3.46	5.23	11.64	0.34
Diluted earnings per ADS equivalent	6.88	16.47	3.46	5.23	11.63	0.34
Basic average shares outstanding[(2)]	17,100	19,766	20,267	20,221	20,223	20,223
Diluted average shares outstanding[(2)]	17,100	19,766	20,267	20,221	20,232	20,232

Table of Contents

	Year ended and as of December 31,					
	1999	2000	2001	2002	2003	2003
	NT$	NT$	NT$	NT$	NT$	US$
	(in millions, except for percentages, earnings per share and per ADS, and operating data)					
US GAAP						
Net sales	76,305	166,860	127,242	162,990	203,600	5,990
Cost of sales	(52,163)	(105,359)	(107,194)	(115,374)	(133,493)	(3,928)
Operating expenses	(12,310)	(44,472)	(41,712)	(20,764)	(25,744)	(757)
Income (loss) from operations	11,832	17,029	(21,664)	26,852	44,363	1,305
Income (loss) before income tax	10,986	20,537	(25,672)	20,210	42,441	1,249
Income tax (expense) benefit	2,383	1,166	3,741	(5,638)	(3,881)	(114)
Net income (loss)	13,884	21,740	(21,975)	14,534	38,661	1,137
Cumulative preferred dividends			(455)	(455)	(184)	(5)
Income (loss) attributable to common shareholders	13,884	21,740	(22,430)	14,079	38,477	1,132
Basic earnings per share[3]	0.82	1.15	(1.14)	0.70	1.91	0.06
Diluted earnings per share[3]	0.82	1.15	(1.14)	0.70	1.91	0.06
Basic earnings per ADS equivalent	4.10	5.77	(5.68)	3.52	9.55	0.28
Diluted earnings per ADS equivalent	4.10	5.77	(5.68)	3.52	9.54	0.28
Basic average shares outstanding[3]	16,928	18,841	19,744	20,027	20,153	20,153
Diluted average shares outstanding[3]	16,928	18,841	19,744	20,027	20,162	20,162
Balance Sheet Data:						
ROC GAAP						
Working capital	33,267	44,920	37,472	62,705	135,394	3,983
Long-term equity investments	16,165	10,664	11,599	10,635	10,748	316
Properties	150,060	244,748	251,288	246,498	211,854	6,233
Goodwill		11,531	11,438	10,159	8,721	257
Total assets	235,436	370,886	366,518	390,542	407,401	11,986
Long-term bank borrowing[4]	22,744	23,339	22,399	11,051	8,800	259
Long-term bonds payable	20,000	29,000	24,000	35,000	30,000	883
Guaranty deposit-in and other liabilities[5]	6,207	9,046	9,479	8,710	8,149	240
Total liabilities	75,341	108,810	89,208	94,594	78,098	2,298
Minority interest equity	7,524	322	120	95	89	2
Capital Stock	85,209	129,894	181,326	199,229	202,666	5,963
Cash Dividend on common shares	0	0	0	0	0	0
Shareholders equity	152,571	261,754	277,190	295,853	329,214	9,686
US GAAP						
Goodwill		58,348	47,464	47,476	47,287	1,391
Total assets	236,859	407,830	393,990	420,528	439,853	12,941
Total liabilities	84,882	114,884	91,419	96,747	81,977	2,412
Mandatory redeemable preferred stock		13,000	13,000	13,000		
Shareholders equity	151,977	279,946	289,450	310,623	357,173	10,508
Other Financial Data:						
ROC GAAP						
Gross margin	41%	47%	27%	32%	37%	37%
Operating margin	29%	37%	10%	19%	25%	25%
Net margin	31%	39%	12%	13%	23%	23%
Capital expenditures	51,459	103,762	70,201	55,236	37,871	1,114
Depreciation and amortization	25,198	41,446	55,323	65,001	69,161	2,035
Cash provided by operating activities	40,253	94,786	75,818	98,507	116,037	3,414
Cash used in investing activities	(60,952)	(120,949)	(77,232)	(62,190)	(53,406)	(1,571)
Cash provided by (used in) financing activities	39,518	35,366	897	(6,346)	(27,370)	(805)
Net cash flow	18,646	9,323	(1,284)	30,234	35,199	1,036

Table of Contents

	Year ended and as of December 31,					
	1999	2000	2001	2002	2003	2003
	NT$	NT$	NT$	NT$	NT$	US$
	(in millions, except for percentages, earnings per share and per ADS, and operating data)					
Operating Data:						
Wafers sold[6]	1,826	3,408	2,159	2,675	3,700	3,700
Average utilization rate[7]	97%	106%	51%	73%	89%	89%

(1) Amounts in 1999 and 2000 reflect the reclassification of NT$1,025 million in 1999 and NT$2,072 million in 2000 from cost of sales to research and development.
(2) Retroactively adjusted for all subsequent stock dividends and employee stock bonuses.
(3) Retroactively adjusted for all subsequent stock dividends.
(4) Excludes bonds payable.
(5) Consists of other long term payables and total other liabilities.
(6) In thousands.
(7) Commencing in 2003, utilization rates exclude engineering wafers and all capacity and production at Vanguard.

Exchange Rates

We publish our financial statements in New Taiwan dollars, the lawful currency of the ROC. In this annual report, $, US$ and U.S. dollars mean United States dollars, and NT$ and NT dollars mean New Taiwan dollars. This annual report contains translations of certain NT dollar amounts into U.S. dollars at specified rates solely for the convenience of the reader. Unless otherwise noted, all translations from NT dollars to U.S. dollars and from U.S. dollars to NT dollars were made at the noon buying rate in The City of New York for cable transfers in NT dollars per U.S. dollar as certified for customs purposes by the Federal Reserve Bank of New York as of December 31, 2003, which was NT$33.99 to US$1.00 on that date. On May 17, 2004, the noon buying rate was NT$33.66 to US$1.00.

Fluctuations in the exchange rate between NT dollars and U.S. dollars will affect the U.S. dollar equivalent of the NT dollar price of our common shares on the Taiwan Stock Exchange and, as a result, will likely affect the market price of our American Depositary Shares (ADSs). These fluctuations will also affect the U.S. dollar conversion by the depositary of any cash dividends paid in NT dollars on, and the NT dollar proceeds received by the depositary from any sale of common shares represented by ADSs, in each case according to the terms of the deposit agreement.

The following table sets forth, for the fiscal years indicated, information concerning the number of NT dollars for which one U.S. dollar could be exchanged based on the noon buying rate for cable transfers in NT dollars as certified for customs purposes by the Federal Reserve Bank of New York.

	NT dollars per U.S. dollar Noon buying rate			
	Average[1]	High	Low	Period-End
1999	NT$ 32.28	NT$ 33.40	NT$ 31.39	NT$ 31.39
2000	31.40	33.20	30.48	33.17

2001	33.82	35.13	32.23	35.00
2002	34.53	35.16	32.85	34.70
2003	34.41	34.98	33.72	33.99
November 2003	34.04	34.20	33.95	34.20
December 2003	34.06	34.15	33.99	33.99
January 2004	33.67	33.98	33.33	33.39
February 2004	33.21	33.36	33.10	33.28
March 2004	33.25	33.42	33.00	33.00
April 2004	32.97	33.27	32.73	33.27
May 2004 (through May 17, 2004)	33.42	33.70	33.14	33.66

(1) Annual averages calculated from month-end rates.

Sources: Federal Reserve Statistical Release H.10(512), 1998-2003, Board of Governors of the Federal Reserve System.

Table of Contents

No representation is made that the NT dollar or U.S. dollar amounts referred to herein could have been or could be converted into U.S. dollars or NT dollars, as the case may be, at any particular rate or at all.

Risk Factors

We wish to caution readers that the following important factors, and those important factors described in other reports submitted to, or filed with, the Securities and Exchange Commission, among other factors, could affect our actual results and could cause our actual results to differ materially from those expressed in any forward-looking statements made by us or on our behalf:

Risks Relating to Our Business

Since we are dependent on the highly cyclical semiconductor and microelectronics industries, which have experienced significant and sometimes prolonged downturns, our revenues, earnings and margins may fluctuate significantly.

Our semiconductor foundry business is affected by market conditions in the highly cyclical semiconductor and microelectronics industries. Most of our customers operate in these industries. Variations in order levels from our customers result in volatility in our revenues and earnings. From time to time, the semiconductor and microelectronics industries have experienced significant, and sometimes prolonged, downturns. Because our business is, and will continue to be, dependent on the requirements of semiconductor and microelectronics companies for our services, downturns in the semiconductor and microelectronics industries lead to reduced demand for our services. For example, starting in the first quarter of 2001, the semiconductor and microelectronics industries experienced significant downturns due to a number of factors including a slowdown in the global economy, oversupply in the microelectronics industry, overcapacity in the semiconductor industry and a worldwide inventory adjustment. Due to the significant downturns in the two industries, most, if not all, of the integrated device manufacturers that had previously begun purchasing wafer fabrication services from foundry companies reduced purchases from foundry companies. If we cannot take appropriate actions such as reducing our costs to sufficiently offset declines in demand, our revenues and earnings will suffer during downturns. As a result of the 2001 downturn in the semiconductor and microelectronics industries, our net sales and net income for 2001 were 24.3% and 77.8%, respectively, less than the corresponding amounts in 2000. Although the semiconductor and microelectronics industries have recovered from the 2001 downturn and our net sales and net income for 2003 significantly increased from the corresponding amounts in 2001, we cannot give any assurances that the recovery will continue and if so, for how long.

Overcapacity in the semiconductor industry may reduce our revenues, earnings and margins.

The prices that we can charge our customers for our services are significantly related to the overall worldwide supply of integrated circuits and semiconductor products. The overall supply of semiconductor products is based in part on the capacity of other companies, which is outside of our control. Historically, companies in the semiconductor industry have expanded aggressively during periods of increased demand such as was the case in 2000, and seems to be occurring again in 2004. As a result, periods of overcapacity in the semiconductor industry have frequently followed periods of increased demand. In a period of overcapacity, if we are unable to offset the adverse effects of overcapacity through, among other things, our technology and product mix, we may have to lower the prices we charge our customers for our services and/or we may have to operate at significantly less than full capacity. Such actions could reduce our margin and weaken our financial condition and results of operations. Due to the decreased annualized demand for semiconductors in 2001 and 2002, our average capacity utilization rate decreased to 51% during 2001 and 73% during 2002 as compared with 106% during 2000. Our average capacity utilization rate was 89% during 2003 (excluding engineering wafers and all capacity and production at Vanguard).

Decreases in demand and average selling price for end-use applications of semiconductor products may adversely affect demand for our products and may result in a decrease in our revenues and earnings.

A vast majority of our sales revenue is derived from customers who use our products in personal computers, communications devices and consumer electronics. Any significant decrease in the demand for end-use applications of our products may decrease the demand for our products and may result in a decrease in our revenues and earnings. In addition, the historical and continuing trend of declining average selling prices of end use

Table of Contents

applications places pressure on the prices of the components that go into these end-use applications. If the average selling prices of end use applications continue to decrease, the pricing pressure on components produced by us may lead to a reduction of our revenue. If all these events occur at the same time, it could have an adverse effect on our revenues and earnings.

If we are unable to compete effectively in the highly competitive foundry segment of the semiconductor industry, we may lose customers and our profit margin and earnings may decrease.

The markets for our foundry services are highly competitive both in Taiwan and internationally. We compete with other dedicated foundry service providers, as well as integrated device manufacturers. A number of dedicated foundry service providers have been expanding their capacity and, as a result, we are facing increased competition from them. Moreover, some integrated device manufacturers from time to time allocate a portion of their capacity to contract production of integrated circuits for others, which brings them in direct competition with us. Some of these companies may have access to more advanced technologies and greater financial and other resources than we have. As a result, these companies may be able to compete more aggressively than we are able to. Increases in competition may decrease our average selling prices, erode our profit margin and weaken our earnings.

If we are unable to remain a technological leader in the semiconductor industry, we may become less competitive and less profitable.

The semiconductor industry and the technologies used are constantly changing. If we do not anticipate these changes in technologies and rapidly develop new and innovative technologies, we may not be able to provide advanced foundry services on competitive terms. If we are unable to maintain the ability to provide advanced foundry services on competitive terms, some of our customers may buy products from our competitors instead of us. As a result, we expect that we will need to offer, on an ongoing basis, increasingly advanced and cost-effective foundry technologies and processes prior to these technologies and processes being offered by our competitors in order to continue to satisfy the increasing requirements of some of our customers. For example, if we are unable to timely offer competitive commercial production of 90 nanometer devices with all copper interconnects, we may lose to competitors providing advanced technologies certain customers requiring such technologies. In addition, advances in technology typically lead to declining average selling prices for older technologies or processes. As a result, if we cannot reduce the costs associated with using older technologies, the profitability of a given product may decrease over time. If we fail to achieve advances in technology or processes or to obtain access to advanced technologies or processes developed by others, we may become less competitive and less profitable.

If we are unable to manage our expansion and modification of our production facilities effectively, our growth prospects may be limited and our future profitability may be affected.

We have recently been ramping up production at Fab 6 in the Southern Taiwan Science Park and our first 300 mm wafer fab, Fab 12 (Phase I), in the Hsinchu Science Park. We have completed the exterior construction of Fab 14 (Phase I), another 300mm fab, in the Southern Taiwan Science Park. We plan to commence production at Fab 14 (Phase I) in the fourth quarter 2004.

Although we have studied the potential effects of vibration from the high speed railway currently planned to pass through the Southern Taiwan Science Park and believe that the vibrations will not affect our yield rate for production in the Southern Taiwan Science Park, we can give no assurances that our yield will not be negatively affected after the high-speed railway has commenced operation.

Expansion and modification of our production facilities will increase our costs. We will need to purchase additional equipment, train personnel to operate the new equipment or hire additional personnel. We will need to increase our net sales accordingly in order to offset these higher costs. If our customers do not correspondingly increase their purchase of our products and services, our financial performance will be adversely affected.

We may not be able to implement our planned growth or development if we are unable to accurately forecast and sufficiently meet our future capital requirements.

Our capital requirements are difficult to plan in the highly cyclical and rapidly changing semiconductor industry. We will continue to need capital to fund the expansion and modification of our facilities. Future

Table of Contents

acquisitions or mergers or other activities may also cause us to require additional funds. Our ability to obtain external financing in the future is subject to a variety of uncertainties, including:

- our future financial condition, results of operations and cash flows;
- general market conditions for financing activities by semiconductor companies; and
- economic, political and other conditions in Taiwan and elsewhere.

Therefore, sufficient external financing may not be available to us on a timely basis, on acceptable terms or at all. As a result, we may be forced to curtail our expansion and modification plans or delay the deployment of our services, thereby possibly becoming less competitive, which could result in a loss of customers and limit the growth of our business.

Our business could suffer if we are unable to retain and recruit qualified personnel.

We depend on the continued services of our executive officers and skilled technical and other personnel. Our business could suffer if we lose the services of some of these personnel and we cannot adequately replace them. We will be required to increase the number of employees due to our expansion. We seek to recruit highly qualified personnel and there is intense competition for the services of these personnel in the semiconductor industry. We expect competition for personnel to increase significantly in the future as new fabless semiconductor companies as well as new semiconductor manufacturing facilities are established. We may need to review employee compensation competitiveness with the purpose of retaining our existing officers and employees and attracting and retaining additional personnel that we expect to require.

We may be unable to obtain in a timely manner and at a reasonable cost the equipment necessary for us to remain competitive and we may become less profitable.

The semiconductor manufacturing business is capital intensive and requires investment in expensive equipment manufactured by a limited number of suppliers. The market for equipment used in semiconductor foundries is characterized, from time to time, by intense demand, limited supply and long delivery cycles. Our operations and expansion plans depend on our ability to obtain a significant amount of equipment from a limited number of suppliers. During times of significant demand for this type of equipment, lead times for delivery can be as long as four to ten months or more. Shortages of equipment could result in an increase in their prices and longer delivery times. In addition, the expansion and modification of fabs by us and other semiconductor companies may put additional pressure on the supply of equipment. If we are unable to obtain equipment in a timely manner and at a reasonable cost, we may be unable to fulfill our customers orders, which could negatively impact our financial condition and results of operations and cause our profit to decrease.

Our revenue and profitability may decline if we are unable to obtain adequate supplies of raw materials in a timely manner and at reasonable prices.

Our production operations require that we obtain adequate supplies of raw materials, such as silicon wafers, gases and chemicals, and photoresistors, on a timely basis. Shortages in the supply of some materials experienced by the semiconductor industry have in the past resulted in occasional price adjustments and delivery delays. We may not, at certain times, be able to obtain adequate supplies of raw materials in a timely manner and at reasonable prices. Our revenue and earnings could decline if we are unable to obtain adequate supplies of high quality raw materials in a timely manner or if there are significant increases in the costs of raw materials that we could not pass on to our customers.

The loss of our coverage under certain Philips cross-license arrangements may require us to incur additional expenses to acquire alternative intellectual property rights.

We are the beneficiary of several patent cross-licensing arrangements between Koninklijke Philips Electronics N.V., or Philips, and other microelectronics companies. Under the TSMC-Philips Technology Cooperation Agreement, or TCA, Philips maintains certain license coverage for our benefit. Several of these license

Table of Contents

agreements are presently being renegotiated by Philips. Certain license rights under several agreements may terminate in the event that Philips equity ownership in us falls below certain percentages, or otherwise. Philips announced that it intends to gradually and orderly reduce its equity interest in us in the long term. See The value of your investment may be reduced by possible future sales of common shares or ADSs by us or our shareholders and Item 7. Major Shareholders and Related Party Transactions Major Shareholders for a further discussion of Philips equity ownership. If Philips is not able to renew the licenses under these agreements, or if our remaining license rights are terminated as a result of the reduction of Philips equity ownership in us to below certain percentages or otherwise, we may not be able to obtain similar licenses without significant expenses. If we are unable to receive any necessary licenses, we may need to consider other alternatives including the possible design around of certain of our processes.

Any inability to obtain, preserve and defend our intellectual property rights could harm our competitive position.

Our ability to compete successfully and to achieve future growth will depend, in part, on our ability to protect our proprietary technologies and to secure on commercially reasonable terms certain technologies that we do not own. Litigation may also be necessary to enforce our patents or other intellectual property rights.

We cannot ensure that we will be able to develop independently, or secure from any third party, all of the technologies required for upgrading our production capabilities. Our failure to successfully obtain such technologies may seriously harm our competitive position.

Our ability to compete successfully also depends on our ability to operate without infringing the intellectual property rights of others. We have no means of knowing what patent applications have been filed in Taiwan, the United States or other jurisdictions until they are published or granted. Because of the complexity of the technologies used and the multitude of patents, copyrights and other overlapping intellectual property rights, it is often difficult for semiconductor companies to determine infringement. Therefore, the semiconductor industry is characterized by frequent litigation regarding patent, trade secret and other intellectual property rights. We have received, from time-to-time, communications from third parties asserting that our technologies, manufacturing processes, the design of the integrated circuits made by us or the use by our customers of semiconductors made by us may infringe their patents or other intellectual property rights. And, because of the nature of the industry, we may continue to receive such communications in the future. In some instances, these disputes have resulted in litigation. In the event any third party were to assert infringement claims against us or our customers, we may have to consider alternatives including, but not limited to:

- Negotiating cross-license agreements using the strength of our patent portfolio to offset any financial costs;
- seeking to acquire licenses to the allegedly infringed patents, which may not be available on commercially reasonable terms, if at all;
- discontinuing using certain process technologies, which could cause us to stop manufacturing certain semiconductors if we were unable to design around the allegedly infringed patents; or
- fighting the matter in court and paying substantial monetary judgments in the event we were to lose.

Any one or several of these developments could place substantial financial and administrative burdens on us and hinder our business. If we fail to obtain certain licenses and if litigation relating to alleged patent infringement or other intellectual property matters occur, it could prevent us from manufacturing particular products or applying particular technologies, which could reduce our opportunities to generate revenues. See Item 8. Financial Information Legal Proceedings for a further discussion.

If the Ministry of Economic Affairs uses a substantial portion of our production capacity, we will not be able to service our other customers.

According to our agreement with the Industrial Technology Research Institute of Taiwan, or ITRI, the Ministry of Economic Affairs of the ROC, or an entity designated by the Ministry of Economic Affairs, has an

Table of Contents

option to purchase up to 35% of our capacity. If the Ministry of Economic Affairs, or an entity designated by the Ministry of Economic Affairs, exercises its option to any significant degree, we may not be able to provide services to all of our other customers unless we are able to increase our capacity accordingly and in a timely manner. Although the Ministry of Economic Affairs has never exercised its option, any significant exercise of this option could damage our relationship with our other customers when demand for our services is strong and may encourage them to purchase more products from our competitors in the future.

We are subject to the risk of loss due to explosion and fire because some of the materials we use in our manufacturing processes are highly combustible.

We use highly combustible materials such as silane and hydrogen in our manufacturing processes and are therefore subject to the risk of loss arising from explosion and fire. The risk of explosion and fire associated with these materials cannot be completely eliminated. Semiconductor companies sometimes experience explosion and fire damage. Although we maintain comprehensive fire insurance up to policy limits, including insurance for loss of property and loss of profit resulting from business interruption, our insurance coverage may not be sufficient to cover all of our potential losses. If any of our fabs were to be damaged or cease operations as a result of an explosion and fire, it would reduce our manufacturing capacity, reduce our revenues and profits and may cause us to lose important customers.

Any impairment charges required under US GAAP may have a material adverse effect on our net income on a US GAAP reconciled basis.

Under US GAAP, we are required to evaluate our equipment and other long-lived assets for impairment whenever there is an indication of impairment. If certain criteria are met, we are required to record an impairment charge. We can give no assurance that impairment charges will not be required in periods subsequent to December 31, 2003. Please see note 28.c. to our consolidated financial statements for a discussion of the criteria which, if met, may require impairment charges.

As a result of a standard under US GAAP that became effective on January 1, 2002, we are no longer permitted to amortize the remaining goodwill. Goodwill amortization expenses amounted to NT$12,051 million under US GAAP for the year ended December 31, 2001. Starting from January 2002, all goodwill must be periodically tested for impairment. As of December 31, 2003, we had NT$47,287 million recorded as goodwill under US GAAP and we found no impairment as of that date. We currently are not able to estimate the extent and timing of any goodwill impairment charge for future years. Any goodwill impairment charge required under US GAAP may have a material adverse effect on our net income for subsequent periods on a US GAAP reconciled basis.

The determination of an impairment charge at any given time is based significantly on our expected results of operations over a number of years subsequent to that time. As a result, an impairment charge is more likely to occur during a period when our operating results are otherwise already depressed. See Item 5. Operating and Financial Review and Prospects Critical Accounting Policies for a discussion of our estimates made for determining an impairment charge.

Any significant decrease in sales to one or more of our major customers may decrease our net sales and net income.

The degree to which our sales are concentrated among a limited number of customers is a function of the foundry outsourcing activities of the respective customers in a given fiscal year. Certain of our customers deal with us on the basis as their sole foundry service provider. As we have over half of the market share of the dedicated foundry segment business, our sales concentration is often a reflection of the business activities of

a cross section of the semiconductor industry that depends on foundry services for wafer outsourcing. Our top ten customers have changed from time to time. In 2002 and 2003, our ten largest customers accounted for approximately 57% and 54% of our net sales, respectively. The decreased sales contribution by our top ten customers in 2003 reflected the fact that we have been successfully expanding our customer base and experiencing higher foundry outsourcing business activities of a broader customer base. Although our top ten customers still accounted for 50% of our net sales in the first quarter of 2004, we believe that our customer base has become more diversified given the changing composition of the top ten customers and a relatively more balanced sales contribution by various customers on

Table of Contents

broader applications. While we believe our customer base is strong and diversified, the fact that a relatively limited number of customers constitute a significant portion of our revenue may remain as a business characteristic inherent to our extensive presence in the dedicated foundry segment of the semiconductor market. Our largest customer in 2002 and 2003, NVIDIA Corporation, accounted for approximately 20% of our net sales in 2002 and 15% of our net sales in 2003. There is no assurance that there will not be any loss or cancellation of business from NVIDIA, or from any of our other major customers, in the future. Loss or cancellation of business from our most significant customers, should there be any, could significantly reduce our net sales and net income.

Risks Relating to the ROC

Relations between the Republic of China and the People s Republic of China (PRC) could negatively affect our business and the market value of your investment.

Our principal executive offices and our principal production facilities are located in Taiwan and a substantial majority of our net revenues are derived from our operations in Taiwan. Taiwan has a unique international political status. The PRC does not recognize the sovereignty of the ROC. Although significant economic and cultural relations have been established during recent years between Taiwan and mainland China, relations have often been strained. The government of the PRC has indicated that it may use military force to gain control over Taiwan in some circumstances, such as a declaration of independence by Taiwan, or foreign power interference in Taiwanese affairs. Past developments in relations between the ROC and the PRC have on occasion depressed the market prices of the securities of Taiwanese companies, including our own. Relations between the ROC and the PRC and other factors affecting military, political or economic conditions in Taiwan could have a material adverse effect on our results of operations, as well as the market price and the liquidity of our ADSs and common shares.

Any political and economical destabilization of the ROC could negatively affect our stock price, our business and results of operations.

In the Taiwan presidential elections held on March 20, 2004, the pro-independence Democratic Progressive Party won by a very narrow margin. The losing Nationalist-People s First Alliance has challenged the validity of the election results and a recount was conducted from May 10, 2004 to May 18, 2004, but the Taiwan High Court has not yet released the results of the recount. Since the election, the market prices of the securities of Taiwanese and Taiwan related companies, including our own, have been adversely affected, with the Taiwan Stock Exchange index falling by 456 points, or 6.7%, on the first day of trading following the presidential elections. There is no assurance that the uncertainty caused by the challenge to the presidential elections and the outcome of the recount will not result in further political or economic destabilization. Any further political or economic destabilization of the ROC could negatively affect our stock price, our business and results of operations.

Our production may be interrupted if we do not have access to sufficient amounts of fresh water or a sufficient supply of electricity.

The semiconductor manufacturing process uses extensive amounts of fresh water. Due to the growth in semiconductor manufacturing capacity in Hsinchu Science Park and Southern Taiwan Science Park, the requirements for fresh water in these industrial parks has grown substantially. In 1997, the ROC government commenced the construction of a fresh water reservoir near Hsinchu Science Park that is expected to satisfy the expected fresh water demands of the Hsinchu region and the Hsinchu Science Park through the year 2021. The construction of the reservoir is expected to be completed in June 2005. In addition, Taiwan experiences droughts from time to time. In 2002 and 2003, Taiwan experienced serious droughts. In order to improve the situation, the water resources agency announced in 2003 that irrigation water should be used for industry usage in northern Taiwan. Previous droughts have not, however, impacted the water supplies to the Southern Taiwan Science Park. We have also implemented a program to reduce fresh water consumption in Hsinchu Science Park and Southern Taiwan Science Park, primarily involving the installation of water recycling at our fabs, which allow us to recycle between 45% to 85% of the water used during the fabrication

process. Although the situation has improved and we have not been adversely affected as a result of previous droughts, there is no assurance that the measures taken to alleviate water shortages will be sufficient to meet our semiconductor production needs and, until additional water resources are made available on a committed basis, the Hsinchu Science Park and the Southern Taiwan Science Park may encounter insufficient water supplies. If there is insufficient water to satisfy our requirements, we may need to

Table of Contents

reduce our semiconductor production. In addition, we have sometimes suffered power outages caused by our major electricity supplier, the Taiwan Power Company, which lead to interruptions in our production schedule. For example, on April 10, 2004, a power outage caused by a circuit trip of Taiwan Power Company affected our fabs in Hsinchu Science Park. Two of our fabs, Fab 8 and Fab 12, were out of power for about one hour causing, according to our estimates, approximately a 0.6 day loss of wafer movement. As a result, material power outages could disrupt the normal operation of our business and have an adverse effect on our financial condition and results of operations.

We are vulnerable to natural disasters which could severely disrupt the normal operation of our business and adversely affect our earnings.

Taiwan is susceptible to earthquakes. On September 21, 1999, Taiwan experienced a severe earthquake that caused significant property damage and loss of life, particularly in the central part of Taiwan. This earthquake caused damage to production facilities and adversely affected the operations of many companies in the semiconductor and other industries. We experienced damages to our machinery and equipment as a result of this severe earthquake. There were also interruptions to our production schedule, primarily as a result of power outages caused by the severe earthquake. Most of our production facilities, as well as many of our suppliers and customers and upstream providers of complementary semiconductor manufacturing services, are located in Taiwan. If our customers are affected by an earthquake or other natural disasters such as typhoons, it could result in a decline in the demand for our services. If our suppliers services are affected, our production schedule could be interrupted or delayed. Although we maintain comprehensive natural perils insurance up to policy limits, including insurance for loss of property and loss of profit resulting from business interruption, our insurance coverage may not be sufficient to cover all of our potential losses. As a result, a major earthquake or natural disaster in Taiwan could severely disrupt the normal operation of our business and have a material adverse effect on our financial condition and results of operations.

Fluctuations in exchange rates could result in foreign exchange losses.

Over half of our capital expenditures and manufacturing costs are denominated in currencies other than NT dollars, primarily U.S. dollars, Japanese yen and Euros. A larger portion of our sales are denominated in U.S. dollars and currencies other than NT dollars. Therefore, we are particularly affected by fluctuations in the exchange rate between the U.S. dollar and the NT dollar. Any significant fluctuation to our disadvantage in such exchange rate may have an adverse effect on our financial condition. In addition, fluctuations in the exchange rate between the U.S. dollar and the NT dollar will affect the U.S. dollar value of our common shares and the market price of the ADSs and of any cash dividends paid in NT dollars on our common shares represented by ADSs.

Any future outbreak of new or unusual diseases may materially and adversely affect our business and results of operations.

An outbreak of a contagious disease such as severe acute respiratory syndrome, or SARS, for which there is no known cure or vaccine, may potentially result in a quarantine of infected employees and related persons, which may affect our operations at one or more of our facilities. Taiwan, together with mainland China, Hong Kong, Singapore and certain other areas experienced in early 2003 an outbreak of SARS. The outbreak of SARS reached its peak in Taiwan in May 2003 and was contained by the health authorities without significantly impacting our operations. We cannot predict at this time the impact any future outbreak of any contagious disease could have on our business and results of operations.

Risks Relating to ownership of ADSs

Your voting rights as a holder of ADSs will be limited.

Holders of American Depositary Receipts (ADRs) evidencing ADSs may exercise voting rights with respect to the common shares represented by these ADSs only in accordance with the provisions of our ADS deposit agreement. The deposit agreement provides that, upon receipt of notice of any meeting of holders of our common shares, the depositary bank will, as soon as practicable thereafter, mail to the holders (i) the notice of the meeting sent by us, (ii) voting instruction forms and (iii) a statement as to the manner in which instructions may be given by the holders.

Table of Contents

ADS holders will not generally be able to exercise the voting rights attaching to the deposited securities on an individual basis. According to the ROC Company Law, the voting rights attaching to the deposited securities must be exercised as to all matters subject to a vote of shareholders collectively in the same manner, except in the case of an election of directors and supervisors. The election of directors and supervisors is by means of cumulative voting. See Item 10. Additional Information Voting of Deposited Securities for a more detailed discussion of the manner in which a holder of ADSs can exercise its voting rights.

You may not be able to participate in rights offerings and may experience dilution of your holdings.

We may, from time to time, distribute rights to our shareholders, including rights to acquire securities. Under our ADS deposit agreement, the depositary bank will not distribute rights to holders of ADSs unless the distribution and sale of rights and the securities to which these rights relate are either exempt from registration under the Securities Act of 1933 with respect to all holders of ADSs, or are registered under the provisions of the Securities Act of 1933. Although we may be eligible to take advantage of certain exemptions for rights offerings by certain foreign companies, we can give no assurance that we can establish an exemption from registration under the Securities Act of 1933, and we are under no obligation to file a registration statement with respect to any such rights or underlying securities or to endeavor to have such a registration statement declared effective. In addition, if the depositary bank is unable to obtain the requisite approval from the Central Bank of China for the conversion of the subscription payments into NT dollars or if the depositary determines that it is unlikely to obtain this approval, we may decide with the depositary bank not to make the rights available to holders of ADSs. See Item 10. Additional Information Foreign Investment in the ROC and Item 10. Additional Information Exchange Controls in the ROC . Accordingly, holders of ADSs may be unable to participate in our rights offerings and may experience dilution of their holdings as a result.

If the depositary bank is unable to sell rights that are not exercised or not distributed or if the sale is not lawful or reasonably practicable, it will allow the rights to lapse, in which case you will receive no value for these rights.

The value of your investment may be reduced by possible future sales of common shares or ADSs by us or our shareholders.

One or more of our existing shareholders may from time to time dispose of significant numbers of common shares or ADSs. One of our two largest shareholders, Philips, sold an aggregate of 100,000,000 ADSs in November 2003. Since October 1997, Philips has sold a total of 124,000,000 ADSs (without adjustment for subsequent dividend distributions) in two transactions. In October 2003, Philips announced its intention to gradually and orderly reduce its equity interest in us. Therefore, further sales by Philips of our common shares or ADSs may occur in the coming years. Moreover, the Development Fund has sold a total of 187,532,800 ADSs (without adjustments for subsequent stock dividends) in several transactions since 1997. The Development Fund, which currently owns 7.42% of our outstanding common shares, announced in February 2004 its intention to sell up to approximately 640 million of our common shares in 2004.

In addition, we have in place a conversion sale program that allows some of our shareholders to sell their common shares in ADS form to a specified financial intermediary during a 30-day period not more than once every three months. Since the establishment of the program in 1999, a total of 42,076,000 ADSs (without adjustments for subsequent stock dividends) were sold in several transactions under the program. We cannot predict the effect, if any, that future sales of ADSs or common shares, or the availability of ADSs or common shares for future sale, will have on the market price of ADSs or common shares prevailing from time to time. Sales of substantial amounts of ADSs or common shares in the public market, or the perception that such sales may occur, could depress the prevailing market price of our ADSs or common shares and could reduce the premium, if any, that the price per ADS on the New York Stock Exchange represents over the corresponding aggregate price of the underlying five common shares on the Taiwan Stock Exchange.

The market value of your investment may fluctuate due to the volatility of, and government intervention in, the ROC securities market.

The Taiwan Stock Exchange has experienced substantial fluctuations in the prices and volumes of sales of listed securities and there are currently limits on the range of daily price movements on the Taiwan Stock Exchange.

Table of Contents

On March 13, 2000, the Taiwan Stock Exchange Index experienced a 617-point drop, which represented the single largest decrease in the history of the Taiwan Stock Exchange Index. Although the Taiwan Stock Exchange Index has experienced increases in the past, from January 1, 2000 to December 31, 2000, the Taiwan Stock Exchange Index dropped from 8,448.8 to 4,739.0, or 43.9%. On May 17, 2004, the Taiwan Stock Exchange Index closed at 5,482.96.

In response to past declines and volatility in the securities markets in Taiwan, and in line with similar activities by other countries in Asia, the government of the ROC formed the Stabilization Fund, which has purchased and may from time to time purchase shares of Taiwan companies to support these markets. In addition, other funds associated with the ROC government have in the past purchased, and may from time to time purchase, shares of Taiwan companies on the Taiwan Stock Exchange or other markets. In the future, market activity by government entities, or the perception that such activity is taking place, may take place or has ceased, may cause fluctuations in the market prices of our ADSs and common shares.

Item 4. Information on the Company

Industry Background

Semiconductors are critical components in an increasingly wide variety of applications. The semiconductor industry s growth has generally been driven by its ability to create advanced and innovative technology that can be used in many areas of the world economy. Advanced semiconductors provide opportunities for semiconductor companies because they generally provide more application possibilities and are expected to command higher prices than less-advanced technologies at any given time. We believe that integrated device manufacturers and foundries that develop the leading-edge technologies early on will have a competitive edge. However, the new technologies entail significant costs to develop and produce. Advanced semiconductors are increasingly challenging to design, require increasingly sophisticated engineering and manufacturing expertise and can be produced only in fabs with the most advanced technologies and equipment. According to IC Insights, the cost of the most advanced fab has grown from approximately US$1.0 billion for a 200mm wafer fab in 1995 to approximately US$2.4 billion for a 300mm fab in 2002. Due to these and other challenges the semiconductor industry has grown more specialized over the past decade, which has led to the emergence of so called fabless design companies that do not maintain any internal manufacturing capacity and of independent dedicated foundries that focus on fabrication services. Prior to the mid 1990s, integrated device manufacturers dominated the semiconductor industry, which performed all steps in the semiconductor manufacturing process from design, mask making, wafer fabrication, assembly and final testing. Today, independent dedicated foundries provide fabrication services to fabless design companies, system companies and integrated device manufacturers. Utilizing foundry services allows these companies to reduce manufacturing costs, efficiently allocate capital, research and development and management resources, and to more readily gain access to manufacturing process technologies and production capacity they do not possess. The high costs associated with the development of new technologies may result in the future in a higher proportion of advanced semiconductors being produced by dedicated foundries. We believe, therefore, that the dedicated foundry segment of the semiconductor industry will grow at a somewhat higher rate than the semiconductor industry as a whole, which we believe may grow at an annual average rate of approximately 8% to 10% over the next ten years.

Overview of the Company

We are the world s largest dedicated semiconductor foundry. As a foundry, we manufacture semiconductors using our advanced production processes for our customers based on their own or third parties proprietary integrated circuit designs. We offer a comprehensive range of leading edge wafer fabrication processes, including processes to manufacture CMOS logic, mixed-signal, radio frequency and embedded memory and BiCMOS mixed-signal and other semiconductors. IC Insights estimates that our revenue market share among dedicated foundries worldwide was 56% in 2002 and 53% in 2003. We also offer design, mask making, probing, testing and assembly services.

We believe that we are the technology leader among the dedicated foundries in terms of net sales of advanced semiconductors with a resolution of 0.18 micron and below, and that we are among the technology leaders in the semiconductor industry generally. Please see Manufacturing Capacity and Technology for a further discussion of our technology. We also believe that we are a leader in manufacturing process management

Table of Contents

capabilities among dedicated foundries. We believe our leading position in advanced technology and manufacturing process management capabilities has contributed to our substantial revenue market share among dedicated foundries.

We believe that our large capacity, particularly for advanced technologies, is a major competitive advantage. Please see Manufacturing Capacity and Technology and Capacity Expansion and Technology Upgrade Plan for a further discussion of our capacity.

We count among our customers many of the world s leading semiconductor companies, ranging from fabless integrated circuit design houses such as Altera Corporation, Broadcom Corporation, NVIDIA Corporation and VIA Technology, Inc., to integrated device manufacturing companies such as Analog Devices, Inc., Motorola Inc. and Philips, and systems companies. Fabless integrated circuit design houses and integrated device manufacturers accounted for approximately 71% and 28%, respectively, of our net sales in 2002 and 2003.

Our History and Structure

We were founded in 1987 as a joint venture among the ROC government, Philips and other private investors and were incorporated in the ROC on February 21, 1987. Our common shares have been listed on the Taiwan Stock Exchange since September 5, 1994 and our ADSs have been listed on the New York Stock Exchange since October 8, 1997.

Vanguard International Semiconductor Corporation. In 1994, we, the ROC Ministry of Economic Affairs and other investors established Vanguard, then an integrated DRAM manufacturer. Vanguard commenced volume commercial production in 1995 and listed its shares on the GreTai Securities Market (formerly known as ROC Over-the-Counter Securities Exchange) in March 1999. As of March 31, 2004, we held a 28.11% interest in Vanguard. Please see Item 7. Major Shareholders and Related Party Transaction Related Party Transactions Vanguard International Semiconductor Corporation for a discussion about the contract terms we entered into with Vanguard.

WaferTech in the United States. In 1996, we entered into a joint venture called WaferTech with several US-based investors to construct and operate a US$1.2 billion foundry in the United States. Initial trial production at WaferTech commenced in July 1998 and commercial production commenced in October 1998. In December 1998, we purchased a part of the interest from the joint venture partners and thereby increased our percentage interest in WaferTech to 68%. By the end of the first quarter of 2001, we had increased our percentage ownership of WaferTech to approximately 99% by purchasing all of the remaining interest of all the joint venture partners. As of March 31, 2004, we owned an approximately 100% equity interest in WaferTech, and the monthly capacity at WaferTech was 30,000 wafers.

Systems on Silicon in Singapore. In March 1999, we entered into an agreement with Philips and EDB Investment Pte. Ltd. to found a joint venture, Systems on Silicon, to build a fab in Singapore. As of March 31, 2004, we owned 32%, Philips owned 48% and EDB Investment Pte. Ltd. owned 20% of Systems on Silicon. The fab commenced production in December 2000. After the ramping up of the production capability at Systems on Silicon to its full capacity, we, together with Philips, have the right to purchase up to 100% of its annual capacity. We and Philips are required to purchase, in the aggregate, at least 70% of Systems on Silicon s full capacity but TSMC alone is not required to purchase more than 28% of the annual installed capacity.

TSMC-Acer. To rapidly increase our capacity in response to strong demand for our services in 1999, in August 1999, we acquired 32% of the outstanding equity securities of Acer Semiconductor Manufacturing Inc., a specialized DRAM manufacturer in Taiwan. Upon our acquisition of this 32% interest, the name of this company was changed to TSMC-Acer Semiconductor Manufacturing Corporation. TSMC-Acer is located in

the Hsinchu Science Park and has one 200mm fab. On June 30, 2000, we acquired by merger the remainder of TSMC-Acer that we did not already own. The merger was accounted for as a purchase. Accordingly, the results of operations for TSMC-Acer have been included in our consolidated financial statements from the date of merger.

Worldwide Semiconductor. To rapidly increase our capacity in response to strong demand for our services in early 2000, in June 2000, we acquired Worldwide Semiconductor, the third-largest dedicated foundry in Taiwan established in May 1996. The merger was accounted for as a pooling-of-interest. Accordingly, our consolidated

Table of Contents

financial statements have been restated to include the results of operation of Worldwide Semiconductor for all periods presented.

Operations in Mainland China. In the fourth quarter of 2001, we established a representative office in Shanghai and began conducting preliminary studies with respect to business opportunities in mainland China in compliance with applicable ROC rules and regulations. The ROC government currently restricts certain types of investments by Taiwanese companies in mainland China. In April 2002, the ROC government announced a partial lifting of the ban on investment by Taiwan semiconductor manufacturing companies in 200mm wafer fabs in mainland China. In September 2002, we submitted an application to the Investment Commission of the Ministry of Economic Affairs of the ROC, or the Investment Commission, for approval to expend US$898 million (including US$371 million as a direct equity investment in TSMC Shanghai) to establish TSMC Shanghai and to construct a 200mm wafer fab. In February 2003, we received preliminary, Phase I , approval for this project. In August 2003, we established TSMC Shanghai, a wholly-owned subsidiary primarily engaged in the manufacturing and selling of integrated circuits. In October 2003, we made a capital investment of NT$1,903 million in TSMC Shanghai. We applied for further, Phase II , approval (relating to the relocation of manufacturing equipment from Taiwan to mainland China) with the ROC Ministry of Economic Affairs in March 2004, and received the Phase II approval on May 11, 2004. The Phase II approval letter also specifies that we may remit up to US$371 million to TSMC Shanghai over the next three years as a direct equity investment in TSMC Shanghai. We currently expect to commence small volume production by the end of 2004 in the 200mm wafer fab in the Songjiang Science Park.

The following table sets forth, as of March 31, 2004, our ownership interest in, and country of incorporation of, our manufacturing subsidiary.

Name of the Subsidiary	State or Jurisdiction of Incorporation	Our Ownership Interest
WaferTech, LLC	Delaware, USA	99.996%

Our principal executive office is currently located at No. 8, Li-Hsin Road 6, Hsinchu Science Park, Taiwan, Republic of China. Our telephone number at that office is (886-3) 563-6688. Our web site is www.tsmc.com. Information contained on our website does not constitute part of this annual report.

Our Facilities

After the combining of operations at two of our 200mm fabs in 2001 and the decommissioning of one of our 150mm wafer fabs (Fab 1) in March 2002, we currently operate one 150mm wafer fab, six 200mm wafer fabs and one 300 mm wafer fab. Our corporate headquarters and six of our fabs are located in the Hsinchu Science Park, one fab is in the Southern Taiwan Science Park and one fab is in the United States. Our corporate headquarters and our six fabs in Hsinchu occupy approximately 275,078 square meters of land. We lease all of this land from the Science-Based Industrial Park Administration in Hsinchu under agreements that will be up for renewal between March 2008 and December 2020. We have arrangements to lease from the Southern Taiwan Science Park Development Office 395,000 square meters of land for our fabs in the Southern Taiwan Science Park. WaferTech owns 1,052,181 square meters of land in the State of Washington in the United States, where the WaferTech fab and related offices are located.

Other than certain equipment under leases located at testing areas and our Fab 7 facility, we own all of the buildings and equipment for our fabs. We have completed the exterior construction of another 300mm fab, Fab 14 (Phase I), in the Southern Taiwan Science Park. We plan to commence production of Fab 14 (Phase I) in the fourth quarter of 2004. We are currently planning to expand our 300mm fabrication capacity through Fab 12 (Phase II) in the Hsinchu Science Park and Fab 14 (Phase II) in the Southern Taiwan Science Park. Fab 12 (Phase II) is expected to, subject to market conditions, commence production in 2005. We do not have firm plans for the timing of completion of construction of, or commencement of production at Fab 14 (Phase II). We will evaluate our plans in this regard on an ongoing basis in light of prevailing market

conditions.

Manufacturing Capacity and Technology

We manufacture semiconductors on silicon wafers based on proprietary designs provided by our customers or third party designers. Two key factors that characterize a foundry s manufacturing capabilities are output capacity and fabrication process technologies. Since our establishment, we have possessed the largest capacity

Table of Contents

among the world s dedicated foundries. We also believe that we are the technology leader among the dedicated foundries in terms of our net sales of advanced semiconductors with a resolution of 0.18 micron and below, and are one of the leaders in the semiconductor industry generally. For example, we announced the semiconductor industry s first fully functional SRAM chip using 90-nanometer CMOS process technology in March 2002, one year ahead of the International Technology Roadmap for Semiconductors, or ITRS. In April 2002, we unveiled NEXSYS, the foundry segment s next-generation technology for system-on-chip semiconductor design and manufacturing. In December 2002, we demonstrated the semiconductor industry s first 25-nanometer transistor. This newly designed fin shaped field effect transistor (FinFET) is the first 25-nanometer CMOS transistor to break through critical power barriers, meeting ITRS targets for high-performance operation at this advanced note. We commenced significant commercial production using 0.13 micron process technology in 2002 and expect to commence commercial production using 90-nanometer in 2004. In February 2004, we announced that our industry-leading low-k technology has entered commercial production and that we are the first semiconductor foundry with proven low-k technology in commercial production, in both the 0.13 micron process technology and the 90-nanometer NEXYS technology. The 90-nanometer NEXYS technology is the first process technology based entirely on low-k dielectrics.

The following table lists our fabs and those of our affiliates, together with the year of commencement of commercial production, technology and capacity during the last five years:

Fab[1]	Year of commencement	Current most advanced technology for volume production[2]	Monthly capacity[3]				
			1999	2000	2001	2002	2003
1[4]	1987		11,910	11,011	11,378		
2	1990	0.45	44,382	43,539	45,225	43,540	42,977
3[5]	1995	0.18	72,000	83,700	82,700	71,000	71,600
5	1997	0.15	28,000	39,500	40,000	34,920	37,800
6	2000	0.13		32,000	41,000	48,700	63,500
7[6]	1995	0.35	10,000	44,000	46,500	22,500	11,800
8[7]	1998	0.15	17,000	48,000	54,700	52,600	63,500
12 (Phase I)	2001	0.13			3,375	11,475	31,797
WaferTech	1998	0.15	20,300	28,000	28,000	30,000	30,000
Vanguard[8]	1994	0.25	9,000	22,000	23,000	28,000	40,200
Systems on Silicon[9]	2000	0.18		400	5,166	8,000	9,600
Total			212,592	352,150	381,044	350,735	402,774

(1) Fab 2 produces 150mm wafers. Fabs 3, 5, 6, 7, 8, WaferTech, Vanguard and Systems on Silicon produce 200mm wafers. Fab 12 (Phase I) produces 300 mm wafers. Fabs 2, 3, 5, 7, 8, 12 (Phase I) and Vanguard are located in Hsinchu Science Park. Fab 6 is located in the Southern Taiwan Science Park. WaferTech is located in the United States and Systems on Silicon is located in Singapore.

(2) In microns, as of year-end.

(3) Estimated capacity in 200mm equivalent wafers as of year-end for the total technology range available for production. Actual capacity during each year will be lower as new production capacity is phased in during the course of the year.

(4) We decommissioned Fab 1, a 150mm fab located at ITRI, on March 31, 2002, because of our decision not to renew our land lease agreement with ITRI since it was an outdated fab.

(5) Fab 4, which commenced operation in 1999 with initial technology of 0.5 micron, was consolidated into Fab 3 during the fourth quarter of 2001.

(6) Represents that portion of the total capacity from TSMC-Acer that we utilized for foundry production prior to the completion of our merger with TSMC-Acer on June 30, 2000 and the total capacity from TSMC-Acer subsequent to the completion of the merger.

(7) Represents the total capacity from Worldwide Semiconductor since 1999, reflecting the restated operating data as a result of pooling-of-interest accounting for the merger with Worldwide Semiconductor on June 30, 2000.

(8) Represents that portion of the total capacity from Vanguard that we had the option to utilize as of December 31, 2000 and December 31, 2001. As of December 31, 2002, the 28,000 monthly capacity represents the 25,000 monthly capacity that we had the contractual option to utilize plus the 3,000 additional capacity that Vanguard made available to us. As of December 31, 2003, the 40,200 monthly capacity represents the 25,000 monthly capacity that we had the contractual option to utilize plus the 15,200 additional capacity that Vanguard made available to us.

(9) Represents that portion of the total capacity that we had the option to utilize as of December 31, 2000, December 31, 2001, December 31, 2002 and December 31, 2003. This fab commenced production in September 2000.

As of December 31, 2003, our monthly capacity was 402,774 wafers, compared to 350,735 wafers at the end of 2002. This increase was primarily due to the expansion of our 0.18, 0.15 micron and 0.13 micron advanced technologies.

Capacity Utilization Rates. One of the key factors influencing our profit margins is our capacity utilization. Because a high percentage of our cost of sales is of a fixed nature, operations at or near full capacity can

Table of Contents

have a significant positive effect on output and profitability. The average utilization rates in 1999, 2000 and 2001 were 97%, 106% and 51%, respectively. The utilization rates for 2000 do not take into account the utilization rates for TSMC-Acer prior to the completion of our merger with TSMC-Acer on June 30, 2000, and the utilization rates prior to 2000 do not take into account the utilization rate for Worldwide Semiconductor and TSMC-Acer. The average utilization rate for each quarter of 2003 was 69%, 88%, 98% and 101%, respectively and 89% for the entire year, compared to a utilization rate of 73% in 2002. Starting from the first quarter of 2003, the capacity utilization rate calculation excludes engineering wafers and Vanguard figures. Other factors affecting utilization rates are the percentage yield of commercially useful wafers during the fabrication process, the complexity of the wafer produced and the actual product mix.

We determine the capacity of a fab based on the capacity ratings given by manufacturers of the equipment used in the fab, adjusted for, among other factors, actual output during uninterrupted trial runs, expected down time due to setup for production runs and maintenance, and expected product mix. Except for regularly scheduled maintenance shutdown, all of our fabs currently operate 24 hours per day, seven days per week. Employees work shifts of 12 hours each day on a two days on, two days off basis, except during periods of annual maintenance.

Mini-Environments. Our fabs are organized into bays grouped by function. The general production environment consists of class 1000 or class 100 clean rooms . A class 100 clean room means a room containing less than 100 particles of contaminants, the size of which is not less than 0.3 micron, per cubic foot. Within the clean rooms, we use the mini-environment approach pioneered by us in which the manufacturing steps are performed in a class 1 (in the case of Fab 3, class 0.1) clean mini-environment. We believe that the mini-environment approach has several advantages. The use of mini-environments results in reductions of building structure costs, mechanical and electrical system requirements and operating costs, allows flexibility in equipment layout, set-up and reconfiguration and facilitates the ramping-up process during capacity expansion.

Capacity Expansion and Technology Upgrade Plans

We intend to maintain our strategy of expanding manufacturing capacity and improving manufacturing process technology to meet both the fabrication and the technological needs of our customers. Based upon preliminary estimates, we expect our monthly capacity to be approximately 474,770 wafers at the end of 2004. The change in our expected capacity in 2004 is primarily due to increased capacity as a result of continued ramping up of Fab 6, Fab 12 (Phase I) and the planned commencement of production at Fab 14 (Phase I) in the fourth quarter of 2004, and capacity increases at Fab 2, Fab 3, Fab 5 and Fab 8 and Systems on Silicon. The capacity increase plan is based on our long term market demand forecast conducted periodically. Our expected capacity by year-end 2004 includes a monthly capacity of approximately 38,400 wafers at Systems on Silicon and Vanguard.

The following table sets forth the range of our circuitry resolution capability and manufacturing capacity, broken down by fabs, as of year-end 2003 and planned resolution capability and capacity during 2004:

Table of Contents

Fab[1]	2003		2004	
	Most advanced technology for volume production[2]	Monthly capacity[3]	Most advanced technology for volume production[2]	Monthly capacity[3]
2	0.45	42,977	0.45	47,590
3[4]	0.18	71,600	0.18	83,310
5	0.15	37,800	0.15	42,520
6	0.13	63,500	0.13	73,000
7	0.35	11,800	0.35	13,400
8	0.15	63,500	0.15	76,500
10[5]			0.35	500
12 (Phase I)	0.13	31,797	0.09	60,300
14 (Phase I)[6]			0.13	6,750
WaferTech	0.15	30,000	0.15	32,500
Vanguard[7]	0.25	40,200	0.25	25,000
Systems on Silicon[8]	0.18	9,600	0.18	13,400
Total		402,774		474,770

(1) Fab 2 produces 150mm wafers. Fabs 3, 5, 6, 7, 8, WaferTech, Vanguard and Systems on Silicon produce 200mm wafers. Fab 12 (Phase I) produces 300mm wafers.
(2) In microns, as of year-end.
(3) Estimated capacity range in 200mm equivalent wafers as of year-end for the total technology range available for production. Actual capacity during each year will be lower as new production capacity is phased in during the course of the year.
(4) Fab 4 was consolidated into Fab 3 during the fourth quarter of 2001.
(5) Fab 10 is the 200mm fab located in the Songjiang Science Park near Shanghai. We currently expect to commence small volume production at this fab by the end of 2004.
(6) We plan to commence production at Fab 14 (Phase I) in the fourth quarter of 2004.
(7) As of December 31, 2003, represents the 25,000 monthly capacity that we had the contractual option to utilize plus the 15,200 additional capacity that Vanguard made available to us. On December 31, 2004, 25,000 monthly capacity represents the monthly capacity that we have the contractual option to utilize. We are currently in negotiations with Vanguard to amend the capacity arrangement. As a result, such monthly capacity may change.
(8) Represents the portion of the total expected capacity that we have the option to utilize.

Our capital expenditures in 2001, 2002 and 2003 were NT$70,201 million, NT$55,236 million and NT$37,871 million (US$1,114 million) on a consolidated basis, respectively. We currently expect our capital expenditures to be approximately US$2,000 million in 2004. During 2004 we anticipate capital expenditures will focus primarily on the following:

ramping up Fab 12 (Phase I), Fab 14 (Phase I), Fab 6, and Fab 10;

construction of Fab 12 (Phase II);

upgrading the technology at Fab 3, Fab 5, Fab 8, and WaferTech; and

research and development projects.

Our unconsolidated, affiliated companies spent NT$6,003 million (US$177 million) for capital expenditures in 2003 and are expected to spend approximately NT$13,000 million (US$382 million) for capital expenditures during 2004.

These investment plans are still preliminary and our expected capital expenditures may increase based upon market conditions.

Commitments by Customers. Several of our customers have entered into arrangements with us to ensure that they have access to specified capacity at our fabs. These arrangements are primarily in the form of deposit agreements. In a deposit agreement, the customer makes in advance a cash deposit for an option on a specified capacity at our fabs. Option deposits are generally credited to wafer purchase prices as shipments are made. As of December 31, 2003, our customers had on deposit an aggregate of approximately US$23 million to reserve future capacity, which reserved capacity for the years 2004 through 2005.

Table of Contents

Markets and Customers

The primary customers of our foundry services are fabless design houses, integrated device manufacturers and systems companies. The following table presents the breakdown of net sales (including revenues associated with application-specific integrated circuits, ASIC, and mask making services) by types of customers during the last three years:

	Year ended December 31,					
	2001		2002		2003	
Customer Type	Net Sales	Percentage	Net Sales	Percentage	Net Sales	Percentage
	(in millions, except percentages)					
Fabless integrated circuit design houses	NT$ 83,260	66.2%	NT$ 114,991	70.9%	NT$ 144,940	71.4%
Integrated device manufacturers	42,071	33.4	45,866	28.2	57,245	28.2
Systems Companies	554	0.4	1,444	0.9	812	0.4
Total	NT$ 125,885	100.0%	NT$ 162,301	100.0%	NT$ 202,997	100.0%

We categorize our net sales based on the country in which the customer is headquartered, which may be different from the net sales for the countries to which we actually sell or ship our products. Under this methodology, the following table presents a geographic breakdown of our net sales during the last three years:

	Year ended December 31,					
	2001		2002		2003	
Region	Net Sales	Percentage	Net Sales	Percentage	Net Sales	Percentage
	(in millions, except percentages)					
North America	NT$ 84,846	67.4%	NT$ 125,523	77.3%	NT$ 154,075	75.9%
Asia	33,548	26.6	30,448	18.8	39,381	19.4
Europe	7,491	6.0	6,330	3.9	9,541	4.7
Total	NT$ 125,885	100.0%	NT$ 162,301	100.0%	NT$ 202,997	100.0%

A significant portion of our net sales are attributable to a relatively small number of our customers. Our top ten customers have changed from time to time. In 2002 and 2003, our ten largest customers accounted for approximately 57% and 54% of our net sales, respectively. Please see Item 3. Key Information Risk Factors Risks Relating to Our Business Any significant decrease in sales to one or more of our major customers may decrease our net sales and net income . Most of our customers operate in cyclical businesses and order levels have varied in the past, and may vary in the future.

Over the years, we have attempted to strategically manage our exposure to the memory semiconductor market by limiting the proportion of memory semiconductor manufacturing services to a designated percentage of total sales revenue. This policy has successfully shielded us from

significant adverse effects resulting from the previous precipitous price drops in the memory semiconductor market.

We have five marketing and customer support offices. The office in Hsinchu serves Asian (excluding Japanese and Chinese) customers. Wholly-owned subsidiaries in the United States, Japan, Shanghai and the Netherlands serve North American, Japanese, mainland Chinese and European customers, respectively. Foundry service sales are technologically intensive and involve frequent and intensive contacts with customers. We believe that the most effective means of marketing our foundry services is by developing direct relationships with our customers. We do not use agents or distributors. Our customer service managers work closely with the sales force by providing integrated services and detailed technical advice and specifications to customers.

The Semiconductor Fabrication Process

The semiconductor fabrication process can be categorized into a series of general stages. The following are the main stages involved in semiconductor production:

Table of Contents

Circuit Design: The layout of the circuit components and interconnections is generally produced at computer-aided design terminals. A complex circuit may be designed in as many as thirty layers of patterns or more.

Mask Making: Each layer of the pattern of the circuit is duplicated on a photographic negative, known as a mask, by an electron beam generator. A mask is also referred to as a reticle.

Wafer Fabrication: This is the process by which raw silicon wafers are modified to form junctions, transistors or interconnects. In this process, the raw wafers are oxidized to form silicon dioxide, which is used as an insulator between the conductors and as an insulating layer for a controlling gate. Through the introduction of various impurities, the characteristics of conduction in the silicon are eventually changed to form a junction or transistor. During the wafer fabrication process, conductor, semiconductor or resistor materials are applied to the wafer in multiple layers in different patterns specified in the masks.

Wafer Probing: After a visual inspection, individual semiconductors, called dies , on a wafer are tested, or probed , electrically. Dies that fail this test are marked to be discarded.

Assembly: Each wafer is cut into individual dies and defective dies are discarded. Good dies are connected to a conductive lead frame or organic substrate-based package and the bonded semiconductors, if lead frame based, are then encapsulated using a plastic molding compound or a ceramic casing.

Testing: Packaged semiconductors are fully tested by the use of specialized testing equipment.

Our Foundry Services

Range of Services. We are primarily engaged in wafer fabrication for foundry customers. We also offer design, mask making, wafer probing and testing services and, on a subcontracted basis, assembly services. Because of our ability to provide a full array of services in addition to wafer fabrication, we are able to accommodate customers with a variety of input and output needs. Almost all of our customers choose to have us make the masks to be used during the fabrication process, as this decreases the risk of damage to the masks that can result from having to transport them. A growing number of customers in recent years have also begun to use our design services. The flexibility in input stages allows us to cater to a variety of customers with different in-house capabilities and thus to service a wider class of customers as compared to a foundry that cannot offer design or mask making services.

Table of Contents

The following diagram illustrates the services we provide, either directly or through outsourcing, to our customers:

Fabrication Processes. We manufacture semiconductors using the complementary metal oxide silicon, CMOS and BiCMOS processes. The CMOS process is currently the dominant semiconductor manufacturing process. In the past, a competing manufacturing process called the bipolar process was also prevalent. The BiCMOS process combines the high speed of the bipolar circuitry and the low power consumption and high density of the CMOS circuitry. We use the CMOS process to manufacture logic semiconductors, memory semiconductors including SRAM, flash memory, mixed-signal semiconductors, which combine analog and digital circuitry in a single semiconductor, and embedded memory semiconductors, which combine logic and memory in a single semiconductor. The BiCMOS process is used to make high-end mixed-signal and other types of semiconductors.

Types of Semiconductors Manufactured by Us. Different types of semiconductors with different specific functions are manufactured using the CMOS and BiCMOS processes by changing the number of and the combinations of conducting, insulating and semiconducting layers and by defining different patterns in which such layers are applied on the wafer. At any given point in time, there are over a hundred different products in various stages of fabrication at a full service foundry like ours. We believe that the keys to maintaining high production quality and utilization rates are our effective management and control of the manufacturing process technology that come from our extensive experience as the longest existing dedicated foundry and our dedication to quality control and process improvements.

The following is a general description of the key types of semiconductors that we manufacture:

Logic Semiconductors: Logic semiconductors process digital data to control the operation of electronic systems. The largest segment of the logic market, standard logic devices, includes microprocessors, microcontrollers, DSPs, graphic chips and chip sets.

Mixed-Signal Semiconductors: Analog/digital semiconductors combine analog and digital devices on a single semiconductor to process both analog signals and digital data. We make mixed-signal semiconductors using both the CMOS and BiCMOS processes. We offer 0.13 micron CMOS process and 0.35 micron BiCMOS and silicon germanium process for manufacturing mixed-signal semiconductors. The primary uses of mixed-signal

Table of Contents

semiconductors are in hard disk drives, wireless communications equipment and network communications equipment, with those made with the BiCMOS process occupying the higher end of the mixed-signal market.

Memory Semiconductors: Memory semiconductors, which are used in electronic systems to store data and program instructions, are generally classified as either volatile memory (which lose their data content when power supplies are switched off) or nonvolatile memory (which retain their data content without the need for a constant power supply). Examples of volatile memory include SRAM and DRAM and examples of nonvolatile memory include electrically EPROM and flash memory. We currently offer CMOS process for the manufacture of SRAM and embedded 1T RAM in resolutions down to 0.13 micron in both high speed and low power designs, and for the manufacture of flash memory and embedded flash in resolutions down to 0.18 micron.

CMOS Image Sensor Semiconductors: Image sensors are primarily used in cameras, surveillance and security systems, and increasingly in vehicles. We are currently the leading foundry for the production of CMOS image sensors, characterized by technology features including low dark current, high sensitivity, smaller pixel size and high dynamic range achieved through integration with mixed mode processes.

High Voltage Semiconductors: We offer a range of high-voltage processes, ranging from 5V to 100V, which are suitable for various panel-size display driver and power IC applications. Applicable voltage range covers up to 18V with double-diffused-drain MOS structures and extends up to 100V with lateral-diffused MOS structures.

The table below presents a breakdown of our net sales during the last three years by each semiconductor type:

	Year ended December 31,					
	2001		2002		2003	
Semiconductor Type	Net Sales	Percentage	Net Sales	Percentage	Net Sales	Percentage
	(in millions, except percentages)					
CMOS						
Logic	NT$ 96,334	76.5%	NT$ 129,630	79.9%	NT$ 157,526	77.6%
Memory	14,821	11.8	4,593	2.8	3,045	1.5
Mixed-Signal[1]	12,953	10.3	26,244	16.2	40,599	20.0
BiCMOS[2]	658	0.5	325	0.2	406	0.2
Others	1,119	0.9	1,509	0.9	1,421	0.7
Total	NT$ 125,885	100.0%	$ 162,301	100.0%	NT$ 202,997	100.0%

(1) Mixed-signal semiconductors made with the CMOS process.
(2) Mixed-signal and other semiconductors made with the BiCMOS process.

Design Services. We offer design services that range from providing our customers with access to the fundamental technology files that facilitate a customer s own semiconductor design to direct design services in which we design a semiconductor based on a customer s requirements.

To facilitate our customers semiconductor designs, in addition to technology files, we offer libraries and other necessary intellectual property to expedite the design of semiconductors, such as standard cells, inputs/outputs, selected memory blocks. We have a dedicated team of engineers who work with our research and development department to develop, or acquire from third parties, selected key libraries and other necessary intellectual property early on in the development of new process technologies so that our customers can quickly design sophisticated semiconductors that utilize the new process technologies. We also have entered into, and will continue to enter into, arrangements with other providers of libraries and other necessary intellectual property to allow our customers access to a broad portfolio.

Certain design services that we offer are also more important for semiconductors of a resolution of 0.13 micron or below because at these resolutions the interconnects significantly impact a semiconductor s performance. We are also able to provide reference design flows generated from our research and development for use in our customers semiconductor designs. For these design services we frequently work together with the major vendors of electronic design automation software products.

Table of Contents

Multiproject Wafers Program. To help our customers reduce costs, we offer a dedicated multiproject wafer processing service that allows us to provide multiple customers with wafers produced with the same mask. This program eliminates costly and time-consuming repetitive mask and wafer runs and reduces mask development costs by a very significant factor, resulting in accelerated time-to-market for our customers. In the fourth quarter of 2000, we extended this program to all customers and library and IP partners using our 0.13 micron process technology. This extension offers a routinely scheduled multiproject wafer run to customers on a shared-cost basis for prototyping and verification.

We developed our multiproject wafer program in response to the current system-on-chip development methodologies, which often require the independent development, prototyping and validation of several cores before they can be integrated onto a single device. By sharing resources with our customers to the extent permissible, the system-on-chip supplier can enjoy reduced prototyping costs and greater confidence that the design will be successful.

Customer Service

We believe that our focus on customer service has been an important factor in attracting leading semiconductor companies as customers. The key elements of our customer service are: