TAIWAN + CHINA

SEMICONDUCTOR OUTLOOK 2006

Taiwan + China
Semiconductor Outlook 2006

The challenges and opportunities presented by the increasing economic integration of the U.S., Taiwan, and China semiconductor industries.

January 12, 2006
Santa Clara, California

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China's Impact on The Semiconductor Industry
2005 Update

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Semiconductor Meeting

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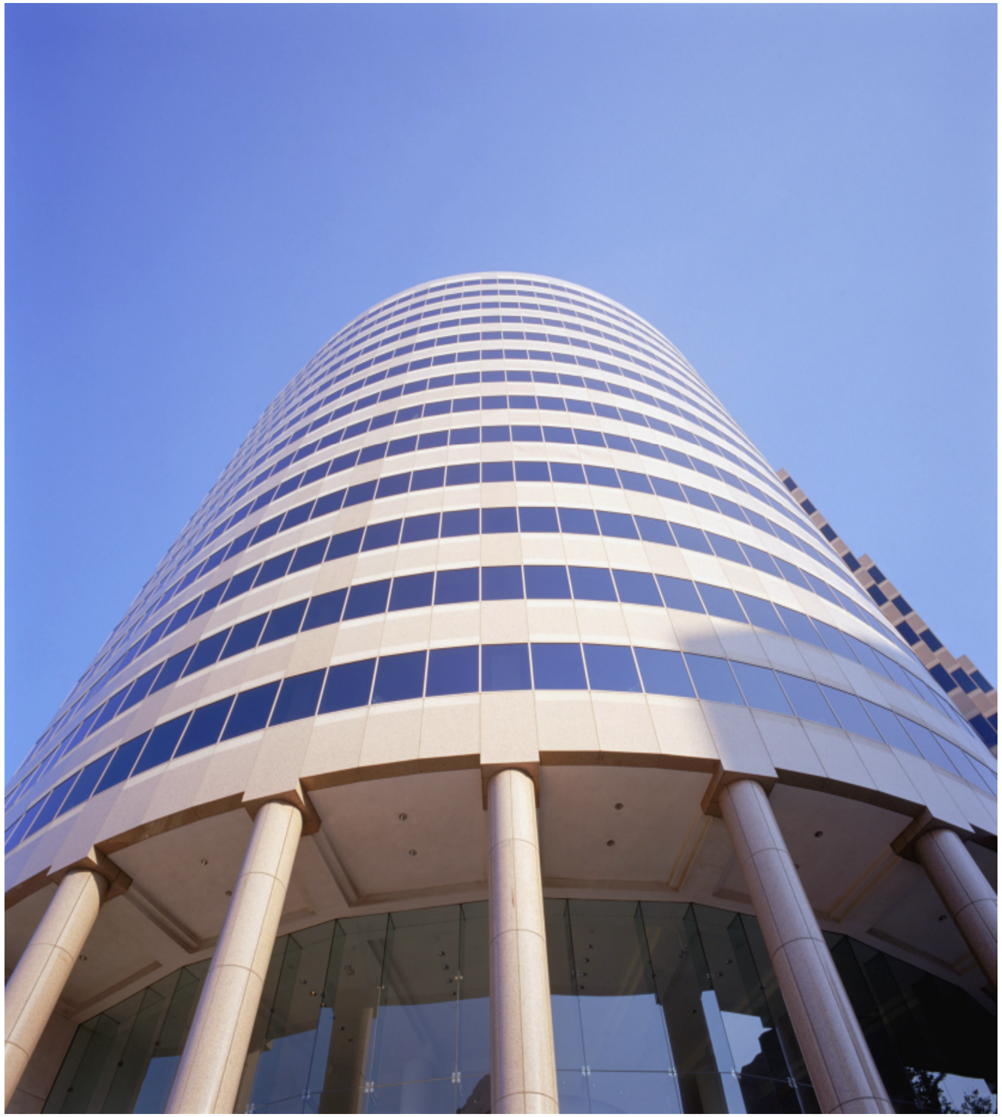
Who Are We?



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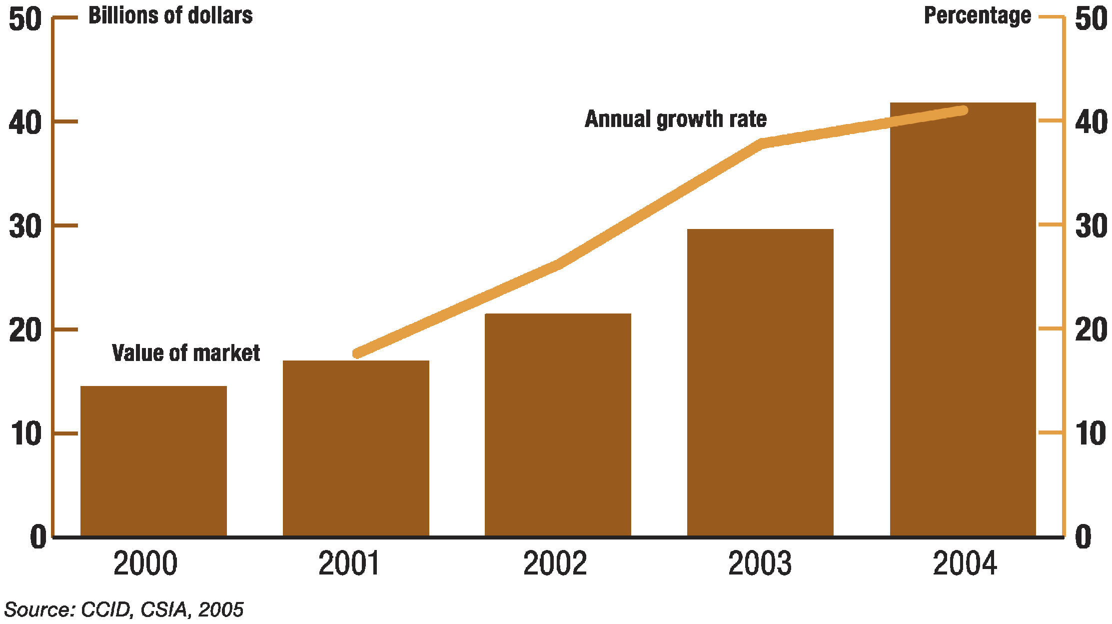
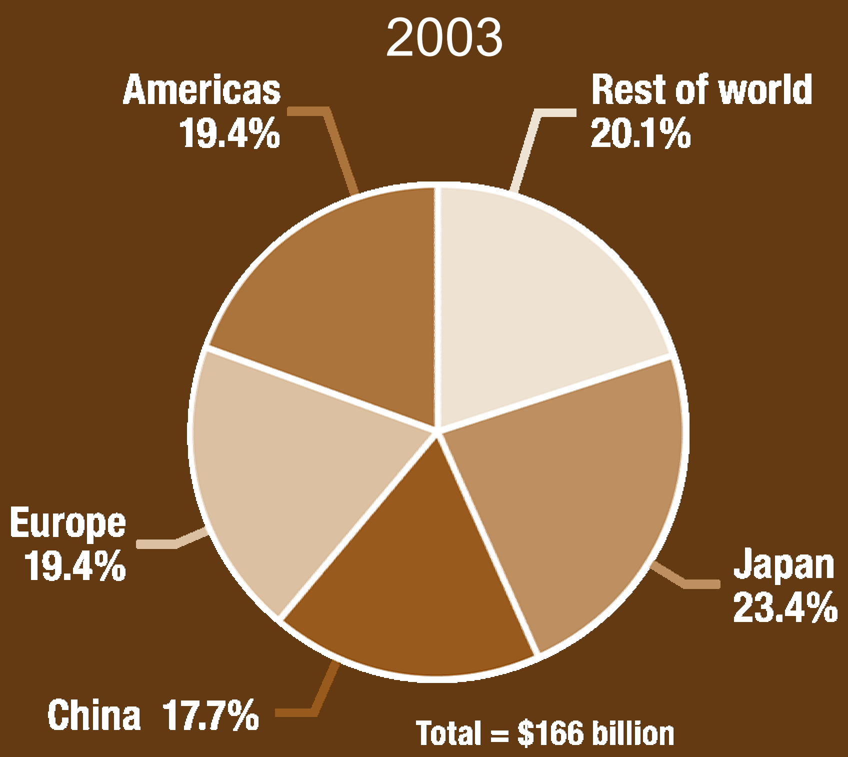
China's Semiconductor Market Growth

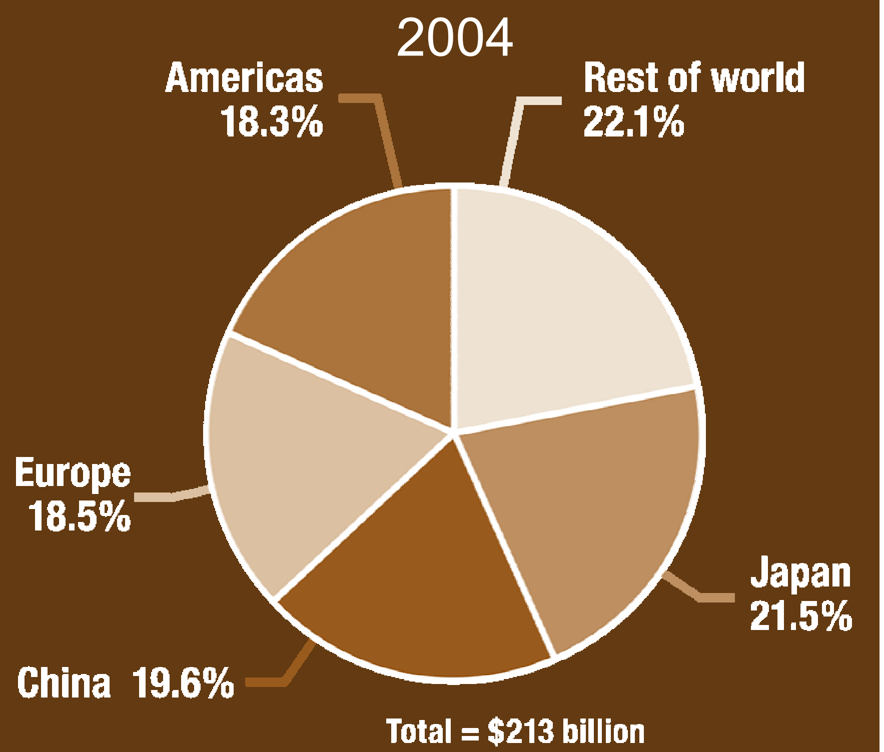


- China's Semiconductor Market is Consumption, i.e. total semiconductors purchased or consumed in China.
- China's Semi Market grew 41% in 2004 to $41.8B versus WW growth of 28%.
- China's share of WW market increased by nearly 2% in 2004 to 19.6% exceeding Europe and Americas for the first time.

Worldwide Semiconductor Market by Region

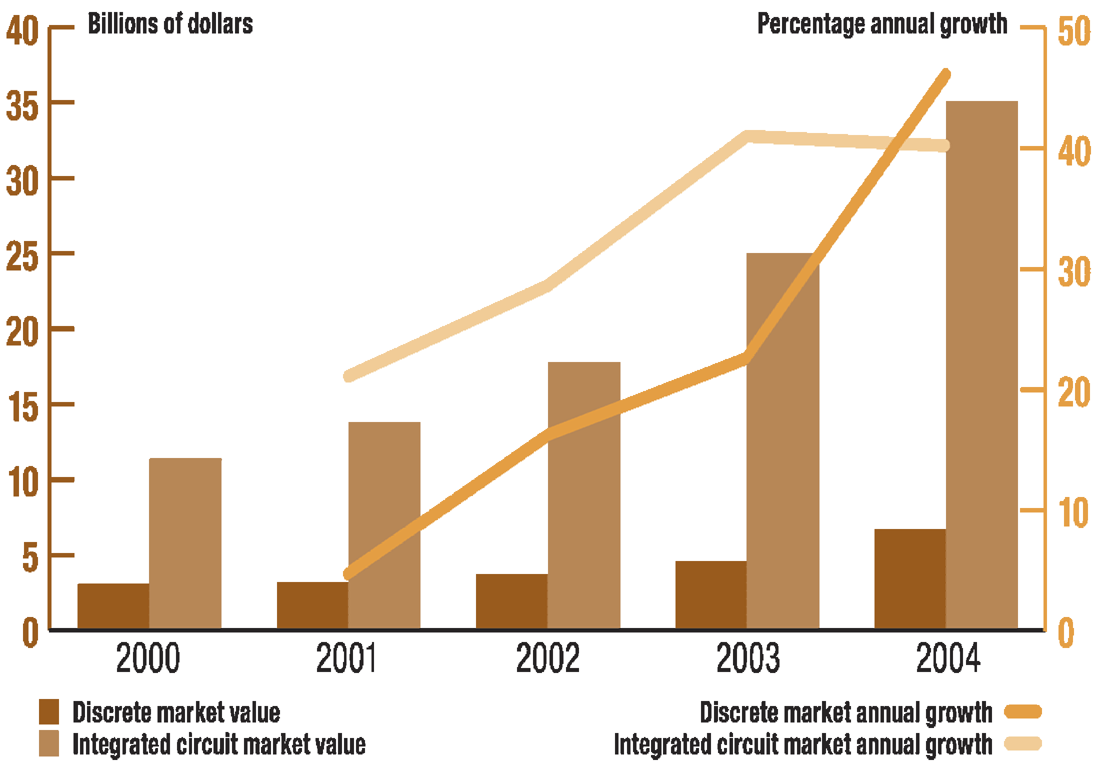


Source: CCID, CSIA, 2005



Source: CCID, CSIA, 2005

China's Integrated Circuit and Discrete Market Growth



Source: CCID, CSIA, 2005 *Discrete includes discrete devices and optical semiconductors*

- China's Discrete Device Market grew faster in 2004 than its IC Market for first time in many years.
- China's Discrete Market grew 46% in 2004 to $6.7B and 19% of WW.
- China's IC Market grew 40% in 2004 to $35.1B and 20% of WW.
- China's Semi Market is somewhat more concentrated in application-specific and general purpose logic sectors than WW.

Semiconductor Suppliers to the Chinese Market, 2003-2004

Rank by revenue			Revenue in millions of dollars			Market share
2003	2004	Company	2003	2004	Change	2004
1	1	Intel	4727	5768	22%	14
4	2	Texas Instruments	1184	1849	56%	4
5	3	Philips Semiconductors	1181	1615	37%	4
2	4	ST Microelectronics	1304	1489	14%	4
6	5	Samsung Electronics	1013	1375	36%	3
9	6	Hynix	690	1365	98%	3
3	7	Toshiba	1282	1343	5%	3
8	8	Infineon Technologies	755	1134	50%	3
7	9	Freescale Semiconductor	767	1094	43%	3
17	10	Micron Technology	299	673	125%	2
Subtotals for top 10			13202	17705	34%	42
10	11	Renesas Technology	511	630	23%	2
25	12	ATI Technologies	217	617	184%	1
11	13	Rohm	481	568	18%	1
19	14	Agilent Technologies	266	558	110%	1
18	15	Broadcom	293	502	71%	1
Subtotals for next 5			1768	2875	63%	7
Subtotals for top 15			14970	20625	38%	49

China Semi Market continues to be dominated by International Suppliers

China’s Semi Market has less supplier concentration than WW.

China’s Semi Market is somewhat more concentrated in computing, communications and consumer sectors than WW.

Largest Chinese Semiconductor Companies, 2004

Rank in 2004	Company	Sector	Revenue in millions of dollars 2003	2004
1	Wuxi CRMH Microelectronics Co. Ltd.	IDM/Foundry	40	93
2	Datang Microelectronics Technology Co. Ltd.	Design (Fabless)	75	91
3	Hanzhou Silan Microelectronics Co. Ltd.	Design (Fabless)	65	61
4	Zuhai Actions Semiconductor Co. Ltd.	Design (Fabless)	0	56
5	China Huada IC Design Center	Design (Fabless)	0	55
6	Beijing Vimicro Semiconductor Co. Ltd.	Design (Fabless)	0	51
7	Jilin Huaxing Electronics Group Co. Ltd.	Discrete	44	50
8	GOOD-ARK (Suzhou) Electronics Co. Ltd.	Discrete	40	45
9	Inferno (Wuxi) Electronics Co. Ltd.	Discrete	0	43
10	Wuxi China Resources Microelectronics, Co. Ltd.	Discrete	35	41
⋮	⋮	⋮	⋮	⋮
26	BLX IC Design Corporation Ltd.	Design (Fabless)	N/A	N/A

Indigenous Chinese companies that design, manufacture, market and sell semiconductor devices.

Only 9 of these 26 companies were included in the foremost 2004 WW market share report yet all have qualifying revenues.

The largest of these 26 would only rank 146th WW.

Combined 2004 revenues of these 26 was < $1B and therefore < 0.5% WW.

Domestic and Export Consumption, 2004

Market segment	Total sales	Export sales: Percentage	Export sales: Value*
Data-processing	22.9	49	11.1
Communications	11.8	66	7.8
Consumer	9.7	79	7.7
Automotive	0.9	75	0.7
Totals	45.4	60	27.4

Source: Gartner Dataquest, PricewaterhouseCoopers, 2005

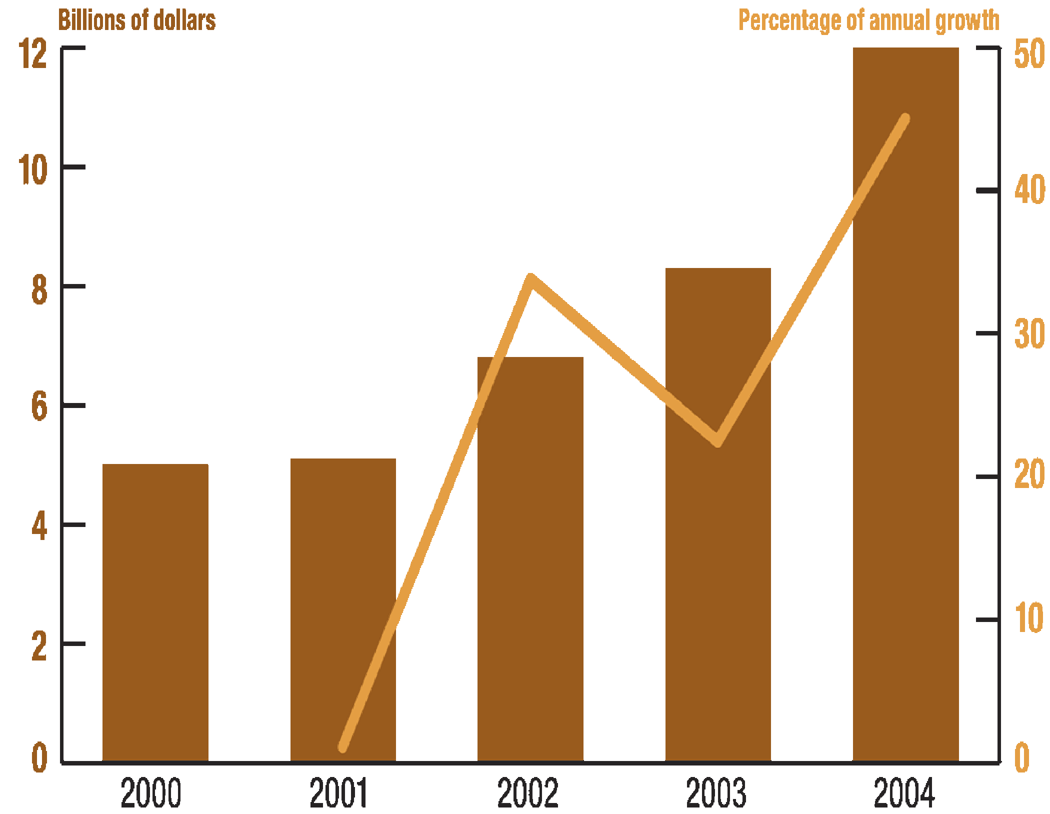
*In billions of dollars

China's Semiconductor Market (consumption) has two parts: domestic & export.

In 2004 only 60% of all semiconductors consumed in China were exported as components of electronic products assembled in China for sales abroad down from 66% in 2003.

Domestic consumption of semiconductors in China increased by 66% in 2004 to $16.6B almost 40% of the total market.

Chinese Semiconductor Production Revenues and Growth, 2000-2004

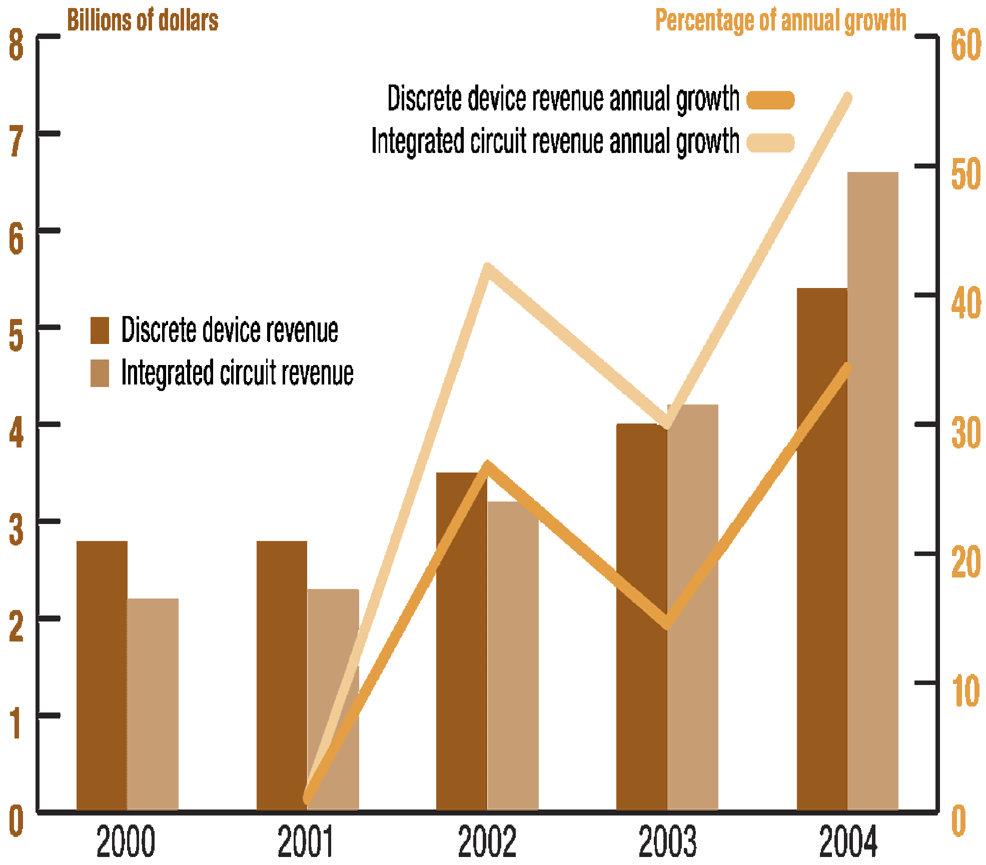


Source: CCID, CSIA, PricewaterhouseCoopers, 2005

• China's Semiconductor Industry (Production) revenue grew by 45% in 2004 to $12.0B versus WW growth of 28%.

•China's Semiconductor Industry accounted for slightly more that 4.9% of WW in 2004 up from 4.2% in 2003 and 2.3% in 2000.

Chinese IC and Discrete Production Growth 2000-2004



Source: CCID, CSIA, PricewaterhouseCoopers, 2005

•China's Semi Industry remains more concentrated in Discretes than WW.

•China's Discrete Industry grew by 34% in 2004 to $5.4B and almost 16% of WW.

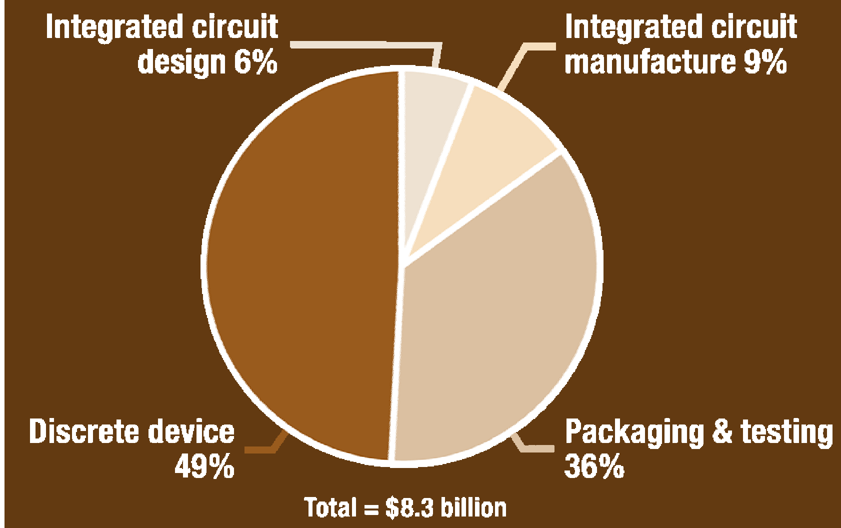
•China's IC Industry grew by 55% in 2004 to $6.6B but < 4% of WW.

•China reported 2004 Industry as Discrete Devices 45%
IC Packaging & Test 29%
IC Mfg'n (IDM+Foundry) 18%
IC Design (Fabless) 8%.

•Industry distribution changed in 2004 due to rapid growth of IC foundry production.

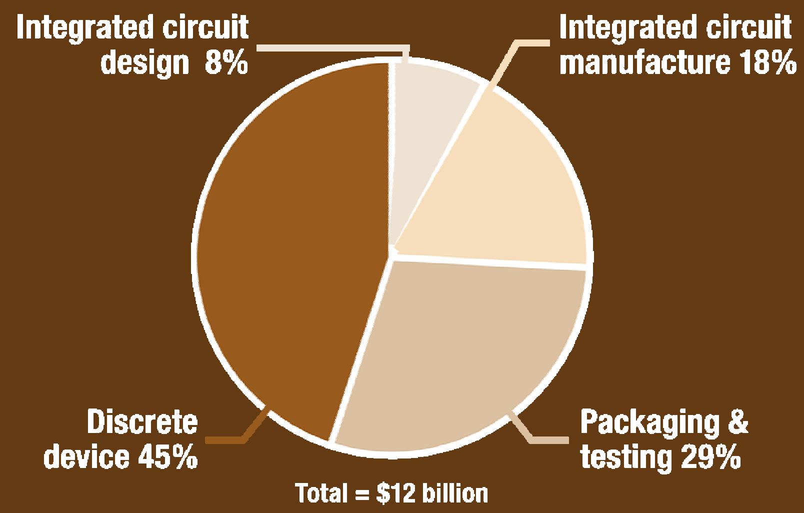
Semiconductor Production Revenue by Sector 2003-2004

2003



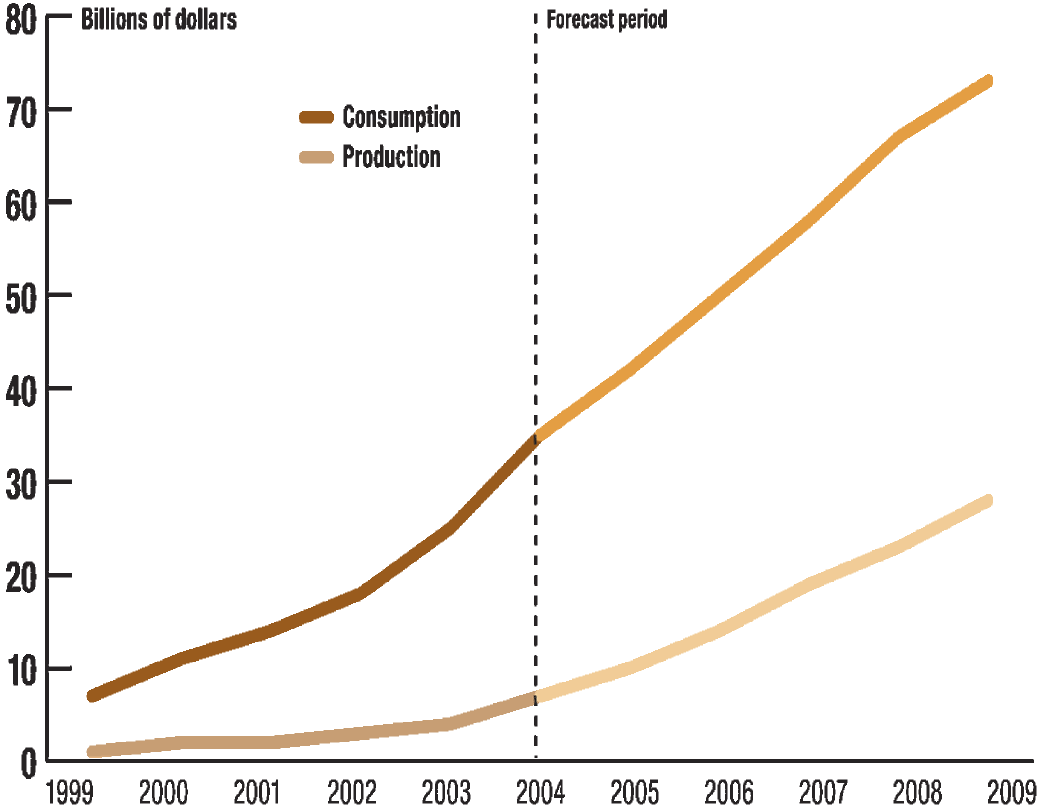
Source: CSIA, CCID, 2005

2004



Source: CSIA, CCID, 2005

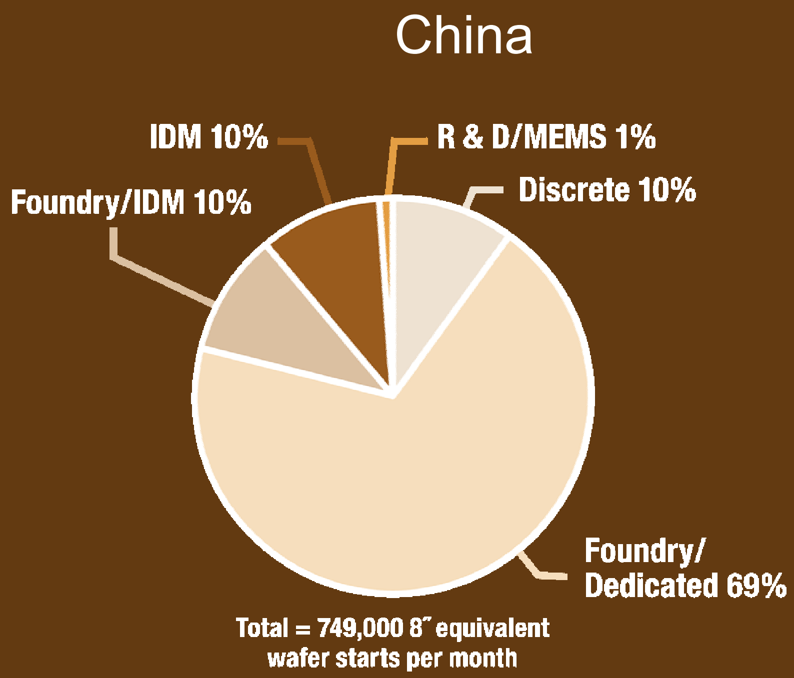
China's Integrated Circuit Consumption Versus Production, 1999-2009



Source: CCID, CSIA, PwC, 2005

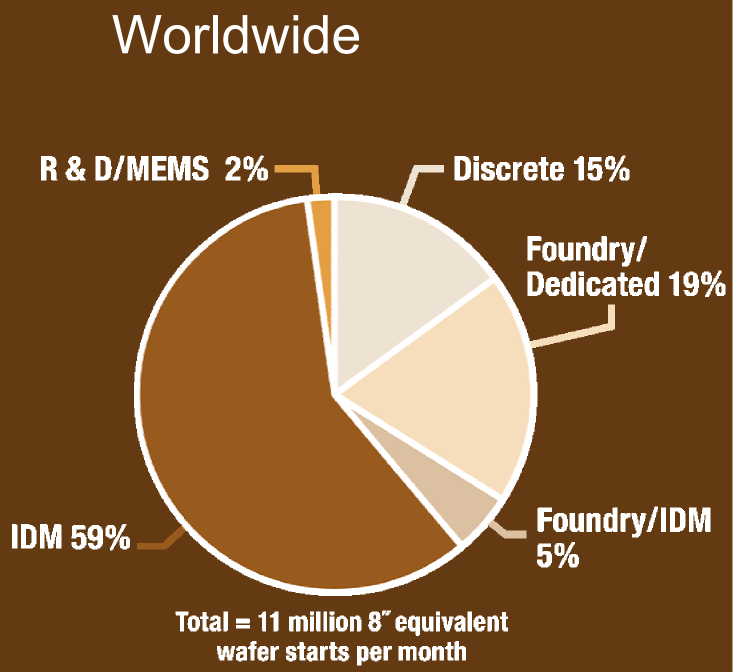
- **IC Consumption / Production Gap (Consumption – Production) continues to increase.**
- **During 2004 IC consumption increased $10B to $35B while IC industry revenues increased only $2.4B to $6.6B.**
- **Although IC industry grew at a faster rate than consumption the gap increased by $7.7B to $28.5B.**
- **Gap has grown from <$1B in 1993 to >$28B by 2004 and is expected to continue to increase through at least 2009.**

Comparison of China and Worldwide Current Wafer Fab Capacity, 2004



Source: World Fab Watch, 2005

Note: WFW probability ≥ 1.0



Source: World Fab Watch, 2005

Note: WFW probability ≥ 1.0

China’s Semiconductor Value Chain Revenues

Value chain activity	Worldwide	China Production	China Consumption	China’s role
Electronic design automation	4.00	0.10	N/A	Software user, not producer
Semiconductor intellectual property	1.20	0.03	N/A	Licensee, not licensor
Equipment	37.10	*0.05	2.73	First-tier and wafer fab buyer; used equipment favored; manufacturer of some SPA&T equipment
Materials	26.70	*0.25	1.17	First-tier buyer, second- or third-tier producer
IDMs	180.00	5.70	35.30	Plant location for large IDMs, domestic source of smaller IDMs
Fabless device companies	33.00	1.00	6.50	Small domestic presence; good supply chain opportunities for other fabless companies
Foundries	17.00	2.30	3.30	Substantial; More than 14% worldwide capacity by 2006
SATS	13.70	1.00	2.60	Substantial; More than 18% worldwide SATS manufacturing space already in China

Source: SEMI, EDAC, FSA, IC Insights, Gartner Dataquest, PricewaterhouseCoopers, 2005

*Chinese domestic companies only; excludes local subsidiaries of foreign companies

China’s role on the supply side of the Semiconductor Value Chain is most significant in Foundry, SATS, & IDM SPA&T operations.

Estimated sum of China’s supply side activity revenues is < 4% of WW.

China’s role on the demand side is first & foremost as a consumer of devices; becoming a growing user of equipment, buyer of materials, and modest licensor of SIP and EDA.

Estimated sum of China’s demand side activity revenues is <17% of WW.

Findings and Implications

- Sharp Rise in Consumption for Local Market
- Shifts in Capacity to China Continue
- Semiconductor Industry Development Continues to Be a Strategic Priority for the Chinese Government
- Raising Demand for Domestic Sources of Supply
- Some Potential for Oversupply
- More Chinese Companies Gaining Visibility
- Less than 10% of Worldwide 300mm Fab Capacity in China by 2010
- Varying Impact on Prices
- Emergence of A Major Chinese IDM

China's Impact on

The Semiconductor Industry

Thank you for your participation

A copy of the complete report and 2005 Update can be found at

www.pwc.com/techcenter