SWTW

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2008 IEEE Semiconductor Wafer Test Workshop

June 8 to 11, 2008

18th Annual SWTW

June 8 to 11, 2008

Paradise Point and Spa, San Diego, CA

IEEE SW Test Workshop
Semiconductor Wafer Test Workshop

Bill Mann (Chair Emeritus)
Jerry Broz, Ph.D. (General Chair)

Probe Year In Review

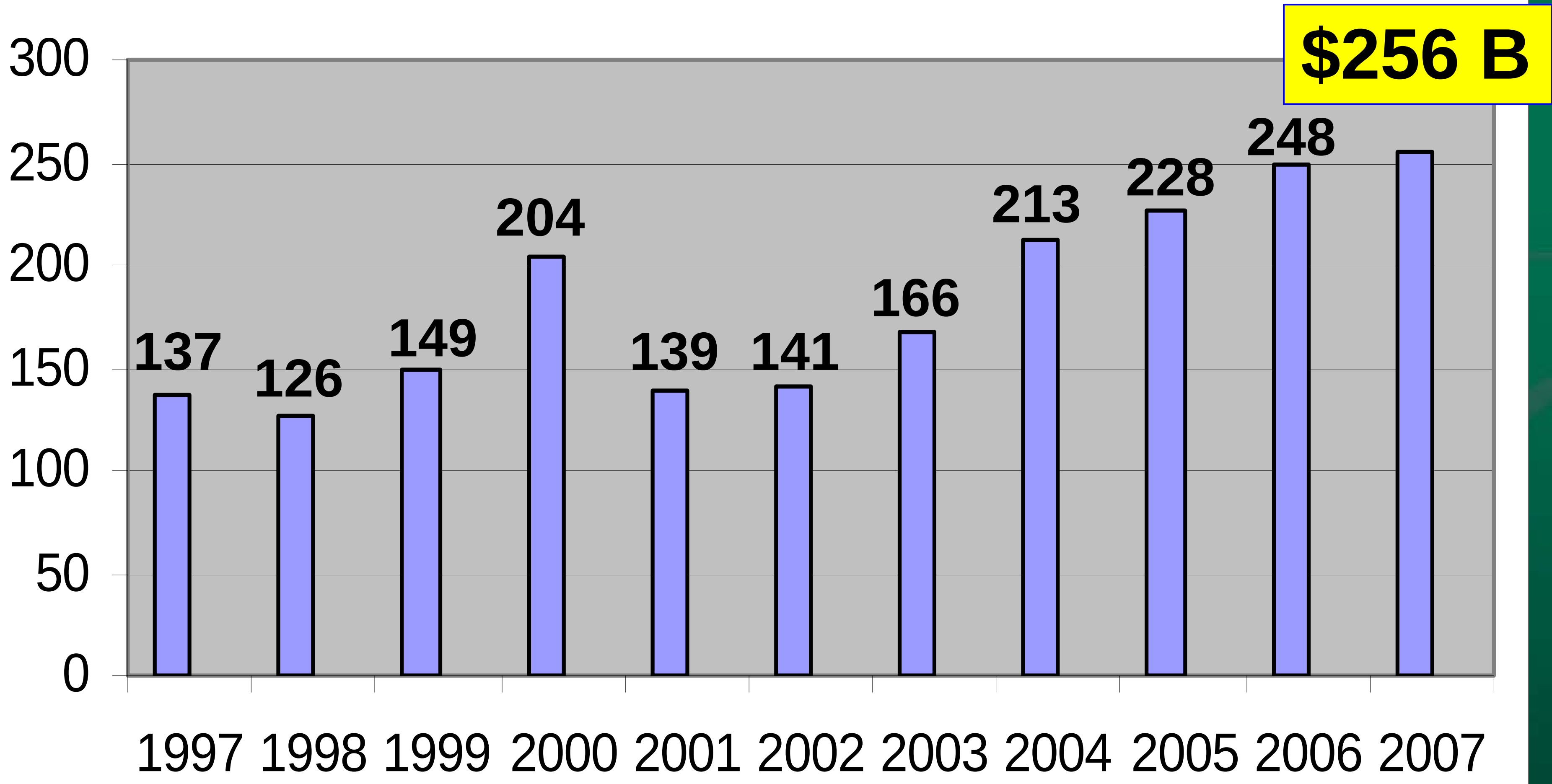
With a lot of help from …

The Final Test Report

Thanks Jim Mulady !

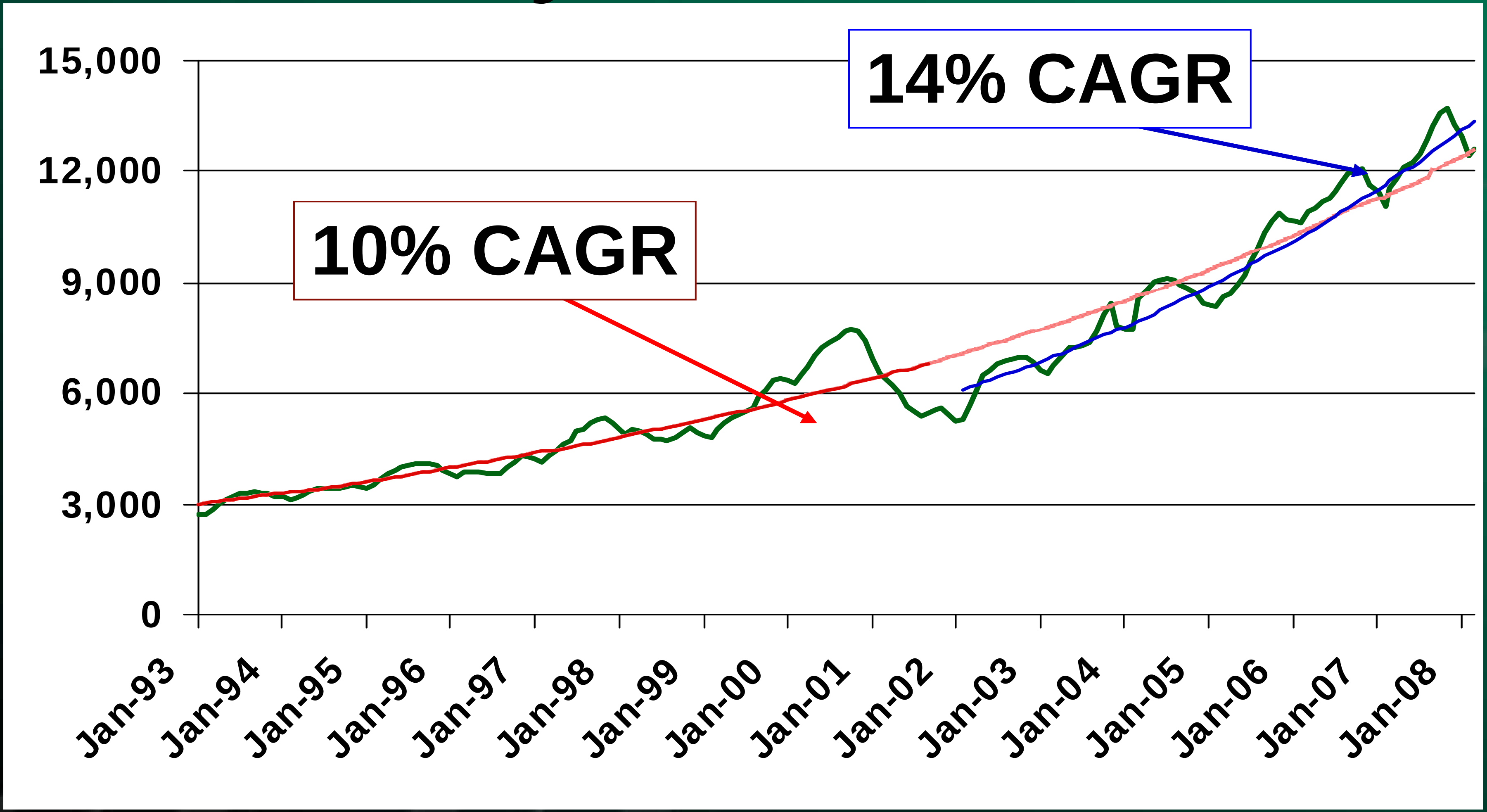
Probe Year In Review

- Key Semiconductor Metrics
- Foundry Activity
- Worldwide Probe Card Revenue
- People in Probe
- Mergers and Acquisitions
- Joint Ventures
- Other Probe News



SIA
SEMICONDUCTOR INDUSTRY ASSOCIATION

Monthly Unit Deliveries



Ron Leckie, Infrastructure Advisors, notes the continued increase in unit deliveries

Key Metrics

	2006	2007
Laptop PCs	80 M	108 M
Desktop PCs	138 M	163 M
Cell Phones	1.01 B	1.15 B
Portable Media Players	178 M	217 M
Image Sensors	1.9 B	2.3 B
LCD Panels	35.7 M m^2	51.1 M m^2
LCD Drivers	2.5 B	2.93 B

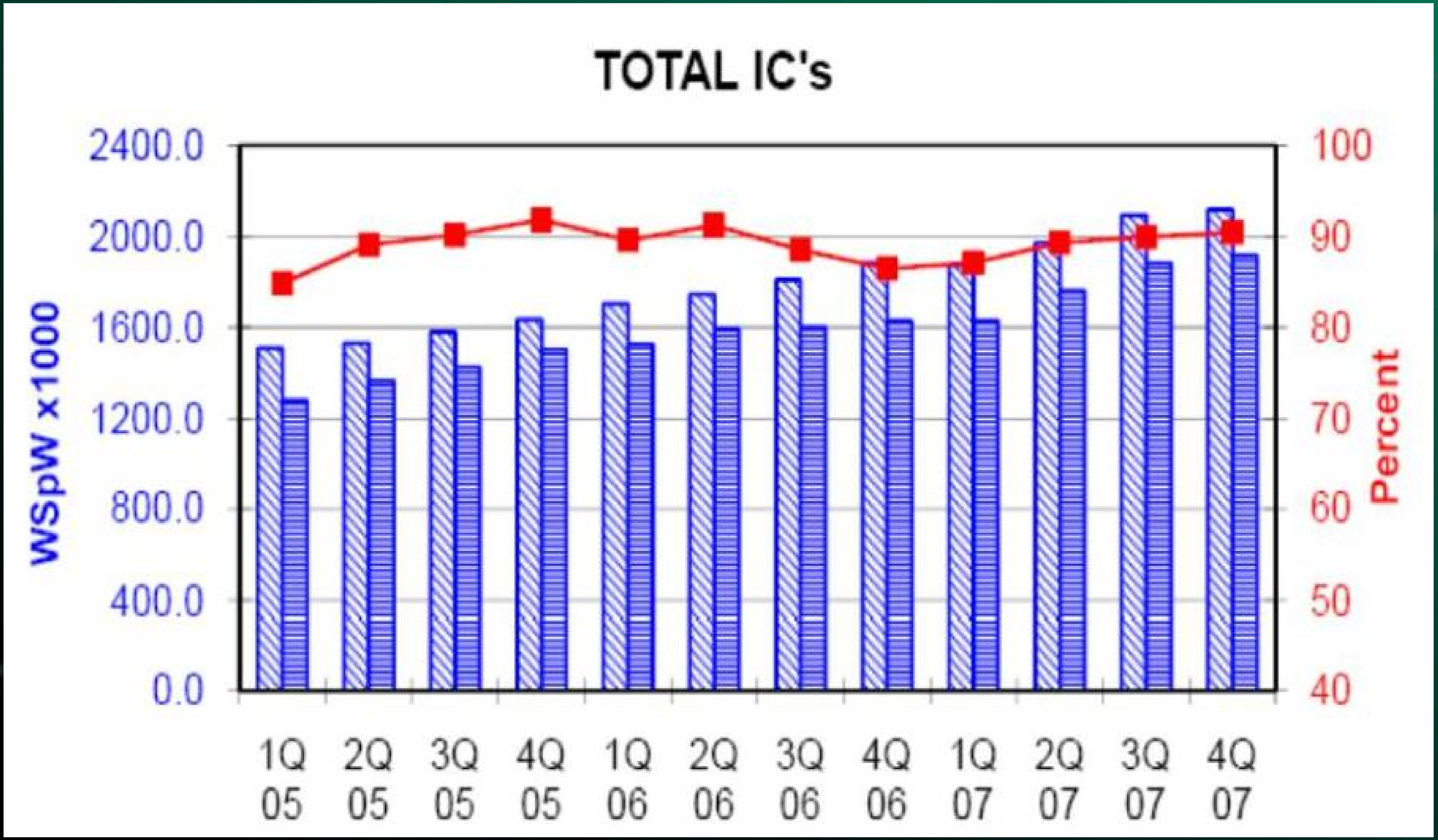
Sources: Gartner, IC Insights, iSuppli, and Display Search

Key Metrics: Memories

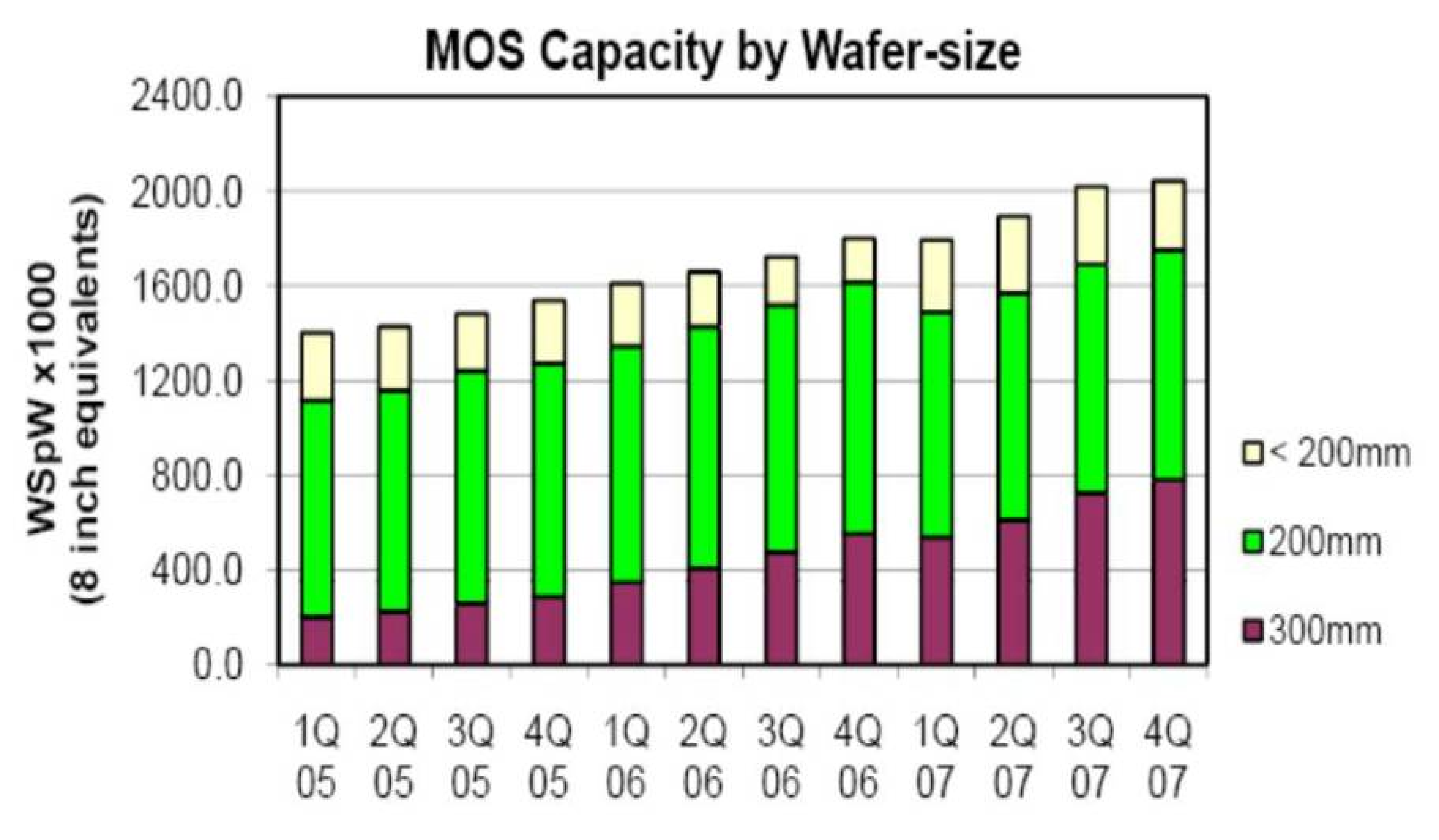
		2006	2007
DRAM	Sales	$33.8 B	$31.3 B
	10^{15} Bytes	2,805	5,335
NOR Flash	Sales	$8.6 B	$6.6 B
	10^{15} Bytes	47	42
NAND Flash	Sales	$11.5 B	$15.3 B
	10^{15} Bytes	669	1,763

Source: Semico Research Corporation

Worldwide MOS Wafer Starts Per Week and Percent Utilization



40% Of Capacity Is 300mm



Next Big Thing

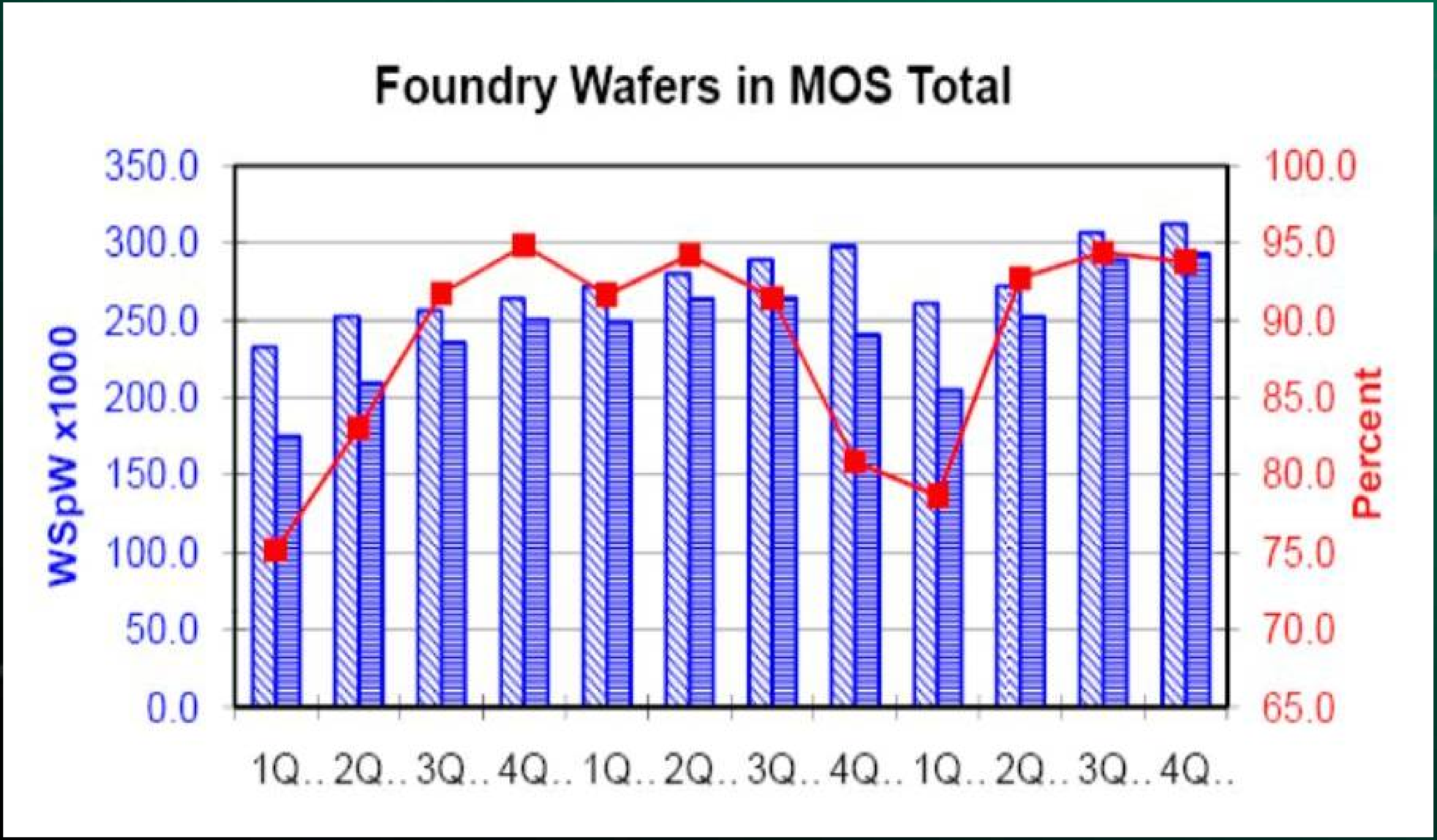
- Intel, Samsung, and TSMC believe the industry should be actively developing 450-mm wafers with pilots in 2012.

200-mm
~1990

300-mm
~ 2000

450-mm
~ 2012

Foundry Capacity Up Slightly But Utilization Increased Dramatically

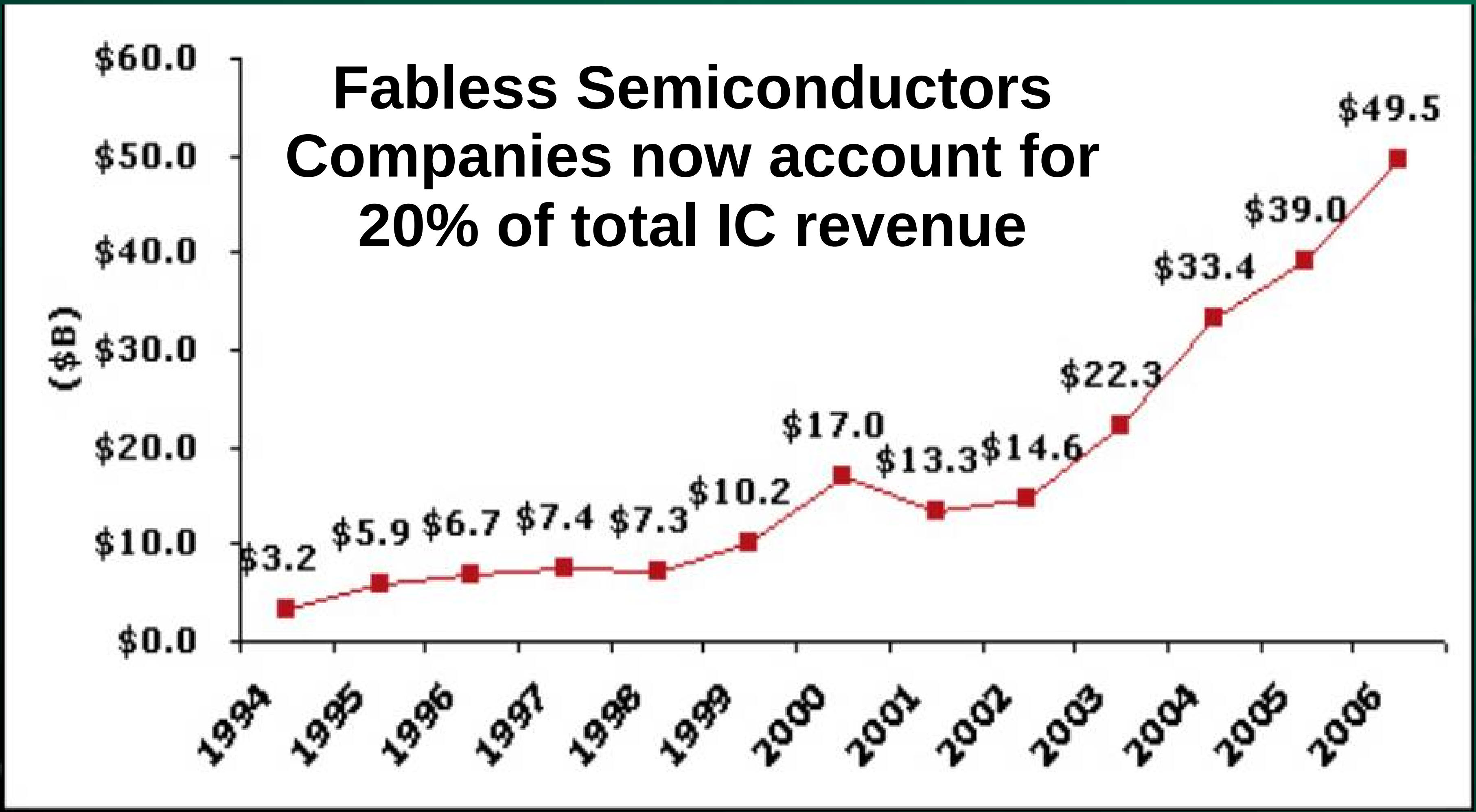


2007 Major IC Foundries

2007 Rank	Company	Foundry Type	Location	2005 Sales ($M)	2006 Sales ($M)	06/05 Sales (%)	2007 Sales ($M)	07/06 Sales (%)
1	TSMC	Pure-Play	Taiwan	8,217	9,748	19%	9,813	1%
2	UMC	Pure-Play	Taiwan	3,259	3,670	13%	3,755	2%
3	SMIC	Pure-Play	China	1,171	1,465	25%	1,550	6%
4	Chartered	Pure-Play	Singapore	1,132	1,527	35%	1,458	-5%
5	TI	IDM	U.S.	540	585	8%	610	4%
6	IBM	IDM	U.S.	665	600	-10%	570	-5%
7	Dongbu	Pure-Play	South Korea	347	456	31%	510	12%
8	Vanguard	Pure-Play	Taiwan	353	398	13%	486	22%
9	X-Fab	Pure-Play	Europe	202	290	44%	410	41%
10	Samsung	IDM	South Korea	—	75	N/A	385	413%
11	SSMC	Pure-Play	Singapore	280	325	16%	350	8%
12	HHNEC	Pure-Play	China	313	315	1%	335	6%
13	He Jian	Pure-Play	China	250	290	16%	330	14%
14	MagnaChip	IDM	South Korea	345	342	-1%	322	-6%

Source: IC Insights, company reports

Total Fabless IC Sales



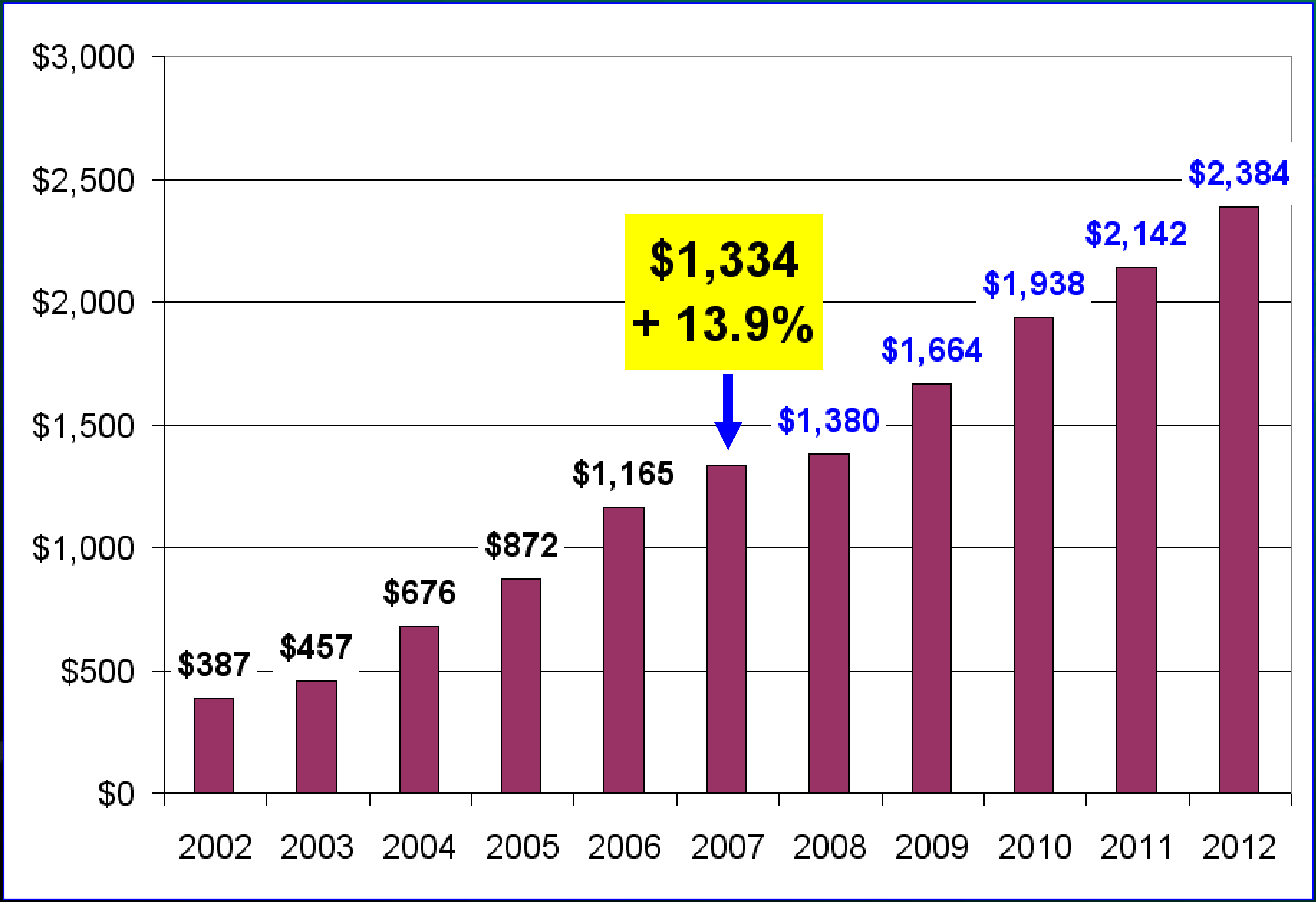
Source: Global Semiconductor Alliance (was FSA)

*Top 10 Probe Card Vendors in 2007

Rank	Company	Sales in US $
1	FormFactor	462.2
2	Micronics Japan (MJC)	162.2
3	Japan Electronic Materials	130.1
4	Phicom Corporation	56.5
5	SV Probe	54.4
6	Tokyo Cathode Laboratories	47.1
7	Technoprobe	36.3
8	MPI	35.5
9	TSE Co., Ltd	33.3
10	NHK	32.4

Thanks Bob Mariner !

Total Probe Card Revenue



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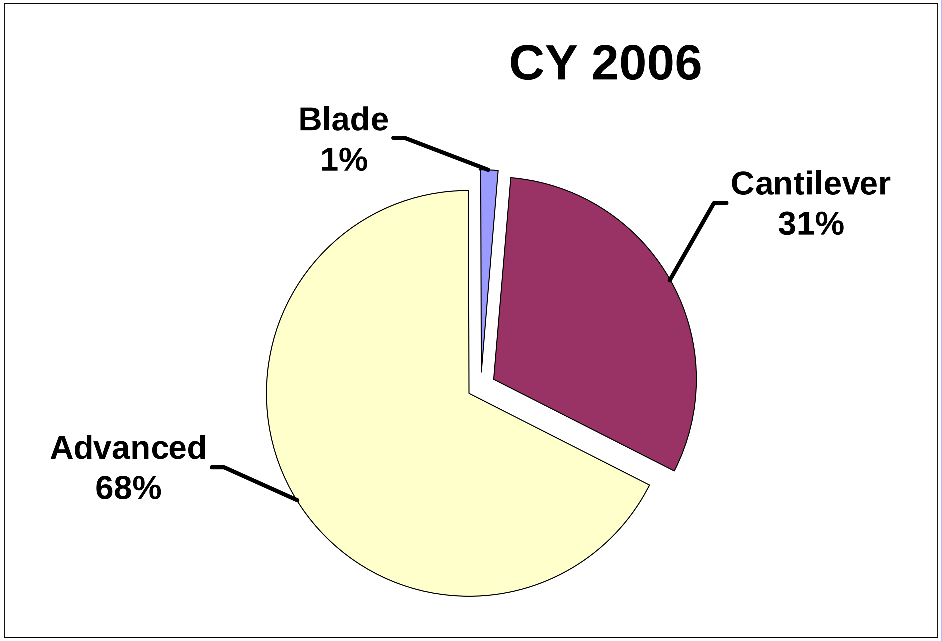
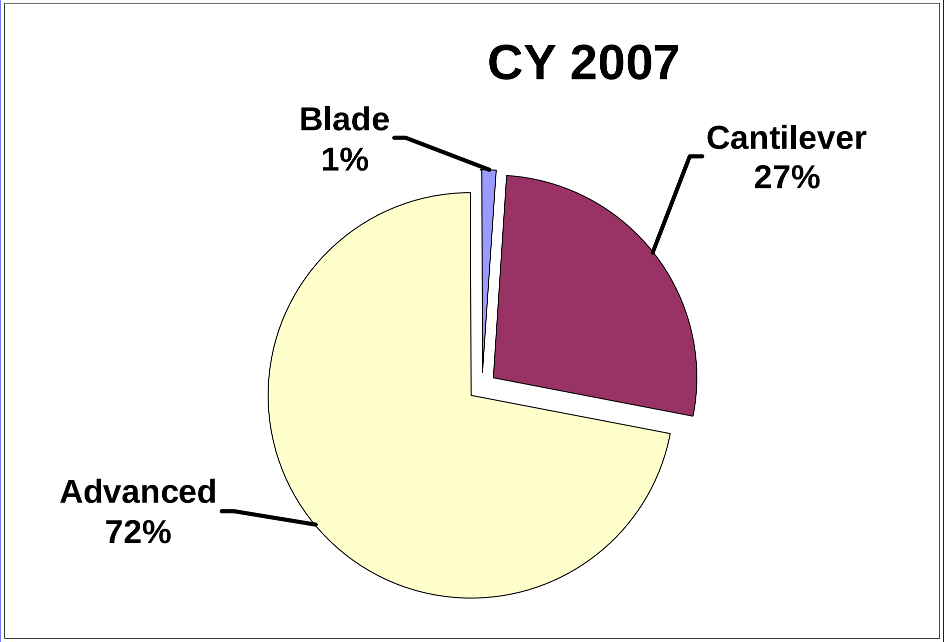
Millions of $US: Excludes Service & Repair

Revenue By Technology



$1,165 M



$1,334 M

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Thanks Bob Mariner !

Why is there some much interest in Probe Cards ???

- Total Global Test Expenditures
  - ATE Equipment
  - Probers
  - Tester / Handlers
  - Probe cards
  - Interface Boards
  - Sockets
  - Etc.

	2003	2007	Predicted 2012
Probe Card ONLY	13.9%	34.4%	50% (?)
Probe Card ONLY	$0.46B	$1.33B	$2.38B

Thanks Bob Mariner !

W O W !

People

In

Probe

June 8 to 11, 2008

Micronics Japan Names New President

Masayoshi Hasegawa

- April 2007
- 10 years at MJC and served as Aomori Plant Manager as well as MJC Vice President
- Economics, Nihon University

Cascade Microtech Names New President & CEO

Geoff Wild

- January 2008
- Previously CEO of Nikon Precision
- General management at Johnson Matthey and Allied Signal
- BS in Chemistry from University of Bath, UK

FormFactor Announces …

- Dr. Mario Ruscev

  President and member of Board of Directors
  - January 2008
  - 23 years at Schlumberger
  - Ph.D. in Nuclear Physics, Yale University

- Kirk Hasserjian

  Sr. Vice President, Global Manufacturing
  - January 2008
  - 25 years at Intel, VP Flash Memory Group
  - Master's in Chemistry, Stanford University

- Jean Bernard Vernet

  Sr. Vice President **and** Chief Financial Officer
  - March 2008
  - Director of Risk and Assistant Treasure
  - MBA, University of Chicago

NanoNexus Names New President & CEO

Brennor Brophy

- April 2008
- 18 Years Semiconductor Experience, 13 Patents
- Previously at Cypress Semiconductor
- Waterford Institute of Technology, Ireland, with a National Diploma in Engineering

JEM Japan Names New Executive VP and GM, R&D

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Kaz Okubo

- April 2008
- 26 years in the Semiconductor industry, 23 years with JEM
- 18 years as President of JEM America
- BSEE Seikei University, Tokyo, and Material Engr. at San Jose State, CA

SV Probe Names
VP Business Development

- **Sergio Perez**
  - March 2008
  - 20 years in the Industry at Teradyne, Advantest and FormFactor, Inc.
  - Founder of Semiconductor Test Consortium
  - MBA Harvard University

- Bill Mann
  - General Chair Emeritus, SW Test Workshop
  - Founder and Lifetime Award Recipient

- Jerry Broz, Ph.D.
  - General Chair, IEEE SW Test Workshop
  - Seven Years as Technical Program Chair

"New" Technical Program Chair

- Brett Crump
  - Technical Program Chair, SW Test Workshop
  - Three Years on SW Test Committee

Heather & Ken Karklin Family Expansion

Congratulations !

W O W !

June 8 to 11, 2008

Mergers And Acquisitions

June 8 to 11, 2008

Rudolph Technologies Goes Shopping

- Rudolph Technologies is a major supplier of process control and defect inspection and analysis equipment
- Rudolph Technologies acquired all intellectual property and selected assets from privately held RVSI Inspection
- Rudolph Technologies acquired the net assets of the semiconductor business of Applied Precision®, LLC.

Evans Analytical Group Buys DSL Labs

- Evans is an independent provider of materials characterization services for the semiconductor industry
- DSL Labs provides turnkey semiconductor test hardware and product qualification solutions

EAG℠
Evans Analytical Group

DSL
LABS
OPTIMIZED PERFORMANCE

Veridiam Buys Point Technology

- **Veridiam is a major integrated metal contractor for the medical, nuclear, aerospace, and other commercial industries**
- **Point Technologies is a full service manufacturer of critical metal wire components, subcomponents and assemblies.**

More Consolidation In ATE

Verigy Buys Inovys

Improves Verigy's Yield Learning Capabilities

Teradyne Buys NexTest

Acquisition Driven by Flash Memory tester

Only 5 ATE companies over $50M annual tester sales

ON Semiconductor Acquires AMIS

- On Semiconductor Corp. acquires AMIS Holdings, Inc. in an all-stock transaction valued at approximately $915 million
- ON Semiconductor's efforts into the ASIC, image sensor and foundry sectors will be complemented by AMIS’s analog and mixed-signal portfolio.

Russian AK Invest. Group Buys French Altis Semiconductor

- Altis is a joint Venture from IBM and Infineon created in July 1999
- The former IBM Fab is located in Corbeil-Essonnes and was the first European semiconductor manufacturing site in 1964
- 25 K m^2 clean room; 42 K 200mm wafers per month; 250 - 130 nm technologies
- Approximate revenue of 450 Euros per year

Tower Acquires Jazz

- $40 M in stock-for-stock transaction
- Combined company will have 750,000, 8 inch equivalent wafer starts per year capacity
- It will become the 7th largest pure play foundry with combined revenues of $ 443 M
- Deal to close during second half of 2008

TOWER SEMICONDUCTOR LTD.

JAZZ SEMICONDUCTOR

Joint Ventures

Intel and STMicro Form Flash Memory Joint Venture

- ST Micro 48.6%, Intel 45.1%, Francisco Partners 6.3%
- Headquartered in Switzerland, with fabs in Italy, Israel, and Singapore

- Numonyx combines Intel's NOR flash memory business and STMicro's NAND business.
- Largest provider of NOR flash memory in the world
- Largest flash supplier to the mobile phone market

HeJian and Elpida JV Fab

- HeJian is a foundry in Suzhou, China
- Company began with 8” fab in 2003
- Eplida is a major Japanese DRAM memory manufacturer
- $3B JV will have a 12” fab at 45 nm

STMicro and NXP Form Wireless IC Joint Venture

- Creates the world's third largest wireless chip company.
  - STMicro will 80 per cent stake in the JV and will pay NXP $1.55B + a control premium.
- JV will have about $3B in combined revenues and over 9,000 employees

A Partnership Between Micron and Nanya?

- Micron entered an R&D and DRAM partnership with Taiwanese memory rival Nanya Technology Corp.

- Goal of partnership is share the soaring development and manufacturing costs for DRAMs.

- Nanya already has a DRAM JV Germany's Qimonda AG, with which Nanya has a DRAM joint venture in Taiwan.

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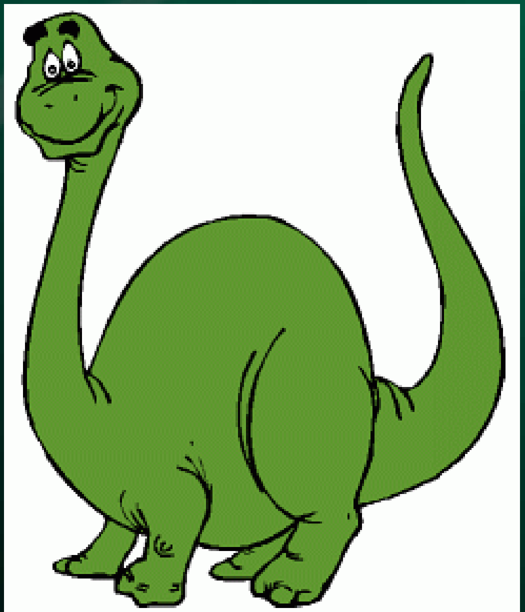
Other Related News

Micron Spins Off Image Business as Aptina Imaging

- Micron set up to spin off the CMOS image sensor business by transforming its sensor business unit into an independent division
- Aptina Imaging will be free to seek alliances with outside foundries

A Decade Of Semiconductor Spin Offs

- **Last year we looked at companies that went fabless; now let's look at companies that spun off *their entire IC businesses*………. WHY????**
  - **Parent company wants to focus on core competencies**
  - **Disaggregation of electronics industry**
  - **Erratic losses and occasional profits**
  - **Very capital intensive industry**



- **Is the IDM model becoming a so-called dinosaur ???**

Date	Parent Company	Spin Off
Jan 1997	National Semi	Fairchild Semi
Jan 1999	Rockwell Int’l.	Conexant
Mar 1999	Siemens	Infineon
Aug 1999	Motorola	On Semi
Jun 2000	Silicon Graphics	MIPS
Sept 2000	NEC & Hitachi	Elpida Memory
June 2002	Lucent	Agere Systems
April 2003	Hitachi & Mitsubishi	Renesas
July 2004	Motorola	Freescale
Oct 2004	Hynix	MagnaChip
Nov 2005	AMD & Fujitsu	Spansion
Dec 2005	Agilent	Avago
May 2006	Infineon	Qimonda
Oct 2006	Phillips	NXP

FAIRCHILD SEMICONDUCTOR

- 50 years ago, Fairchild Semiconductor began the Microelectronics Revolution
- They developed the tools and processes for transistor production
- Their Planar versus Mesa Transistor enabled integrated circuits

Microprobe Celebrates
35th Birthday, April 23, 2008

Wentworth Celebrates 40th year on October 3, 2007

June 8 to 11, 2008

There's

More

News

… BUT …

Keynote Speaker

“Wafer Test Industries Impact on ATE”

Debbora Ahlgren
Vice President and
Chief Marketing Officer

Verigy, Inc.