

THE TOP 10

WORLD'S LEADING SEMICONDUCTOR COMPANIES

SAMPLE PAGES (Previous Edition)

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TABLE MO-2

WORLD SEMICONDUCTOR MARKET
ESTIMATED SALES GROWTH BY PRODUCT SEGMENT

Product Segment

Integrated Circuits

Digital

Logic

Memory

DRAM

Other

Analog (Linear/Mixed Signal)

Discrete

Optoelectronics

Total

TABLE MO-4

WORLD SEMICONDUCTOR MARKET
ESTIMATED SALES GROWTH BY GEOGRAPHIC REGION

Geographic Region

Asia/Pacific

Japan

Americas

Europe

Total

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I. **EXECUTIVE SUMMARY**

A. **Business Organization**

- ! Publicly traded since March 2000.
- ! Prior to 1999, was Siemens Semiconductor Group.
- ! Established Infineon Technologies Flash (previously Ingentix) in 2001.
- ! Also in 2001, sold infrared components business to Vishay Intertechnology.
- ! The following year, sold gallium arsenide business to TriQuint Semiconductor.
- ! In October 2002, purchased Ardent Technologies for \$42 million, and acquired Ericsson Microelectronics.
- ! In 2003, bought SensorNor and Morphics Technologies.
- ! In 2004, Siemens reduced stake in Infineon.
- ! Acquired ADMtek in 2004.
- ! Sold fiber optics business to Finisar.
- ! Organized into Memory Products, Secure Mobile Solutions (including Wireless Solutions and Security & Chip Card ICs), Automotive & Industrial, and Wireline Communications segments.

B. **Facilities and Employees**

- ! Headquartered in Munich, Germany, with operations throughout Europe, Asia and North America.
- ! In August 1998, opened semiconductor factory in Portugal.
- ! In September 1998, closed chip plant in Tyneside.

Sweden, is a major supplier of Bluetooth solutions and Radio Frequency (RF) components for mobile phones and wireless infrastructure as well as a supplier of RF microelectronic components for wireless application, high-end power amplifiers, Bluetooth components and broadband communications. As part of the acquisition, Infineon acquired assets related to Ericsson's microelectronics business including in-process research and development. The company also entered into a strategic supply agreement with Ericsson to deliver wireless solutions products.

In 2003, the company acquired SensoNor, a Norwegian company which develops, produces and markets tire pressure and acceleration sensors. The purchase was intended to strengthen Infineon's position in semiconductors for the automotive industry.

In April 2003, Infineon acquired MorphICs Technology, a developer of digital baseband circuits of third-generation wireless communications.

In 2004, Siemens reduced its stake in Infineon as part of a plan to remove itself from the memory chip sector. Ultimately, Siemens will completely exit Infineon.

In 2004, Infineon made its first acquisition of a controlling stake in an Asian semiconductor company, acquiring ADMtek, a fabless broadband customer premise equipment IC design company based in Hsinchu, Taiwan, for approximately \$100 million in cash. The company plans to establish a new company, Infineon-ADMtek Co., headquartered in Hsinchu, that will focus on developing broadband customer premise equipment (CPE) ICs and allow Infineon's wireline communications group to enter the home gateway market.

come up with a prototype of the 64-megabit DRAM chip in conjunction with IBM and the high-performance neural computer SYNAPSE in 1994. In 1995, 256-megabit DRAM chip with IBM/Toshiba.

In 1998, Siemens developed a low-cost microchip for fingerprint recognition. From the project's inception to the finished prototype, they needed just seven months. That was possible only because our interdisciplinary cross-Group network enable use to draw on the knowledge and know-how of everyone involved. Over 65,000 tiny sensor elements measure the exact distance from the skin to the surface of the chip. The chip bases this fingerprint image as a digital record to a processor which then extracts between one and two dozen characteristic points -- ending ridges, for example -- and compares them with the original stored data.

The company is part of a strategic technology development partnership with IBM, Chartered semiconductor Manufacturing and Samsung. The four firms will focus on 654 nm technology and will extend to include 45 nm process development. Joint development takes place at IBM's Advance Semiconductor Technology Center in East Fishkill, NY.

Infineon was one of the first to move to 300 millimeter wafers. The technology allows the company to etch more than twice as many chips per wafer than 200-millimeter technology.

In 2004, Hynix Semiconductor and ProMOS Technologies entered into a long-term strategic alliance in technology licensing, foundry service and development of new generation memory production processes. Infineon, once a parent company of ProMOS,

Principal Products	Principal Applications
Memory Products	
Mainstream DRAMs (128-Mbit high-end DRAMs (512-Mbit, Rambus, DDR), high-speed graphics DRAMs, low-power Mobile-RAMs, ASICs with embedded DRAM, hard disk controllers	Personal and notebook computers, PC upgrades, workstations and servers, communications equipment, PDAs, computer peripherals
Wireless Solutions	
Baseband Ics, RF Ics, silicon discretcs, semiconductors for mobile radio basestations	Mobile telephone systems, cordless telephone systems (GSM, GPRS, UMTS, WDCT, DECT and Bluebooth)
Security & Chip Card ICs	
Security memories, Security controllers, FingerTIP, MultiMedia Cards	Communications (SIM, prepaid), payment, identification (governmental, health, item management), computing (platform security, biometrics), entertainment (pay-TV, content projection)
Automotive and Industrial	
Power semiconductors (discretcs modules), sensors and microcontrollers (8-bit, 16-bit, 32-bit) with embedded memory	<u>Automotive:</u> Powertrain (engine control, transmission control), body and convenience (comfort electronics, air conditioning), safety and vehicle dynamics (ABS, airbag, stability control), infotainment (dashboard, car radio, telematics/navigation). <u>Industrial:</u> Power management and supplies, drives and power distribution
Codecs, SLICs, ISDN, DSL, T1/E1, SONET/SDH ICs for routing, switching and optical modules	Internet access, WAN, MAN, LAN

VII. MARKETING TACTICS

In April 2004, NEC reorganized its nine business lines into 11 business units and shifted to a new business structure with a newly established "Marketing Unit" to plan marketing measures for the whole company.

Since its reorganization, NEC is marketing itself as an Internet solutions provider. In fact, one of the reasons for the reorganization was to focus itself more clearly on particular market segments. The company sees its strengths in three solutions markets — corporate customers and consumers, network operators, and manufacturers of Internet-related equipment. It sees itself as a solutions provider that enables clients to switch over to next-generation equipment while still using their existing equipment. The company also sees itself as a total service provider, from the planning of information systems through to their maintenance.

The company and its subsidiaries have 400 sales offices in cities throughout Japan, and have 150 marketing and service subsidiaries in 34 other countries.

In order to position in the Internet marketplace, the company announced in September of 2000 that it would spend \$150 million for the U.S. market alone on developing handsets and related products that have third-generation EDGE technology.

In 2001, NEC established a new company, Auraline in the U.S. to offer direct marketing services.

NEC uses strategic collaborations to support marketing efforts. In 2000, for example, NEC formed a marketing alliance with eBay Japan; and BEA Systems. The company merged its HNSX Supercomputer sales operation in the U.S. with Cray in

TABLE MT-3

MOTOROLA
SALES GROWTH BY BUSINESS SEGMENT

Business Segment

Personal Communications

Semiconductor Products

Global Telecom Solutions

Commercial, Government &

Industrial Solutions

Integrated Electronic Systems

Broadband Communications

Other Products

Adjustments & Eliminations

Total

TABLE IL-5

INTEL
OPERATING PROFIT GROWTH BY BUSINESS SEGMENT

Business Segment

Architecture

Communications

Wireless Communications

& Computing

Other

Total

TABLE ST-7

STMICROELECTRONICS
SALES GROWTH BY GEOGRAPHIC REGION

Geographic Region

Singapore
The Netherlands
USA
France
Japan
Italy
Other Countries

Total

IX. R&D EXPENDITURES AND MAJOR PROGRAMS

In 2004, Renesas invested an estimated \$1.1 billion, or 12.5% of sales, in R&D. Product Technology and Production Departments are responsible for core device technology development. For future core technology, with the focus on design and production, Renesas contracts some research projects with advanced research facilities of Hitachi and Mitsubishi, or outsources them to other companies.

Microcontrollers, SoC Devices and Other Logistics

Renesas is developing a new RISC core for 32-bit RISC microcomputers, while continuing to develop and support the existing SuperH and M32R families of products. The chip will be aimed at processor applications, such as mobile phone processors and car information systems, and controller applications, such as vehicle engine control. Renesas is developing next-generation memory technology that uses metal oxide nitride oxide silicon (MONO)-type memory structure, which reduces the module size to half that of NOR memory, while maintaining high read speeds of 100 MHz and programming speeds of five to ten seconds per megabyte. The company is also enhancing its CISC cores for low-end applications and developing its own new processor core.

! Mixed Signal Devices

Renesas is working to improve low power consumption from a number of angles, including developing new techniques, concentrating on the manufacturing process, creating libraries, developing circuit designs, using software based control and EDA tools.

The following table summarizes Infineon's main programs by R&D center.

R&D Facility	Main Programs
Munich, Germany	Main product development site; CAD, library, simulation technologies, layout synthesis, mixed signal, radio-frequency, DRAM, 16-bit microcontrollers, ASICs with embedded DRAM, chip card ICs
Bangalore	Software development, library, design flow
Dresden	Flash and DRAM technology development
Düsseldorf	Mobile communications, radio frequency
Graz	Chip card ICs, radio frequency
Hanover	Mobile ICs
Kista	Wireless systems
Nuremberg	Software for wireless systems
Regensburg	Packaging, testing
Singapore	Logic ICs, 8/32-bit microcontrollers, telecommunications
Sophia Antipolis	Modules for radio-frequency ICs, digital signal processing, library
Villach	Power semiconductor products, mixed signal, automotive and telecommunications applications

X. COLLABORATIVE ARRANGEMENTS

Intel is party to a number of partnership agreements. Following is a review of the company's major collaborations.

! AT&T

In 2002, Intel joined with AT&T, IBM, Apax Partners and 3i to form an open access Wi-Fi company, Cometa Networks. Cometa provides broadband, wholesale wireless Internet access nationwide to telecommunications companies, ISPs, cable operators and wireless carriers.

! Carrefour

In 2004, Intel joined with Carrefour, the Metro Group and Tesco to form a European working group intended to accelerate the adoption of Electronic Product Code (EPC) technology. Members of the group are actively piloting EPC, the next generation bar code and radio frequency identification (RFID) technologies in their supply chains. Carrefour is Europe's leading retailer with over 10,000 stores in 30 countries.

! China Mobile

In 2003, Intel entered into an agreement with China Mobile to launch wireless telephone networks in China. China Mobile and China Netcom are responsible for building the WLAN hot-spots in public sites, while Intel produces wireless packages based on Centrino.

! China Netcom

In 2003, Intel entered into an agreement with China Netcom to launch wireless telephone networks in China.

nature of this market, NEC has further restructured Packard Bell NEC withdrew from the consumer PC business in North America.

As part of a strategy to respond to rapidly changing markets, NEC is marketing several advanced communications systems such as ATM switches, synchronous digital hierarchy (SDH) systems, and broadband access systems. NEC is also trying to reach a new market for a specific product--the perfectly flat MultiSync FE series cathode ray tube. This flat screen is being marketed to a much broader audience than just Fortune 1000 corporate customers as it has many applications such as financial analysis, Internet browsing, graphic and web design, and programming.

NEC is one of several companies that are developing high speed broadband networks for information processing needed by individual market sectors such as communications carriers, corporate customers and broadcasters. The company is also attempting to expand in growing markets such as PDP's and rechargeable lithium-ion batteries.

Because of price competition, NEC is attempting to minimize its inventories in other ways. It is establishing a build-to-order system for corporate customers and a comprehensive supply chain management system, beginning with procurement and ending with sales, for the consumer PC business.

NEC may need to partner with its competitors in order to stay competitive in the global, Internet-based market, and has already made specific alliances with several companies.