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## investor

Biochips like this flow-thru chip from Infineon could transform the work done in pharmaceutical laboratories just as dramatically as the personal computer changed the computer landscape two decades ago.

# A High-Tech Lab One Square Centimeter in Size 

Biochips gather information about diseases and discover new medicines using a genetic zipper

Microelectronics and biology? Not exactly what you would consider to be an ideal couple. Yet during the last 20 years, both disciplines have moved much closer together. This applies particularly to the smallest building block of matter. The interdisciplinary field of nanoscience has emerged at the very frontiers of physics, chemistry, molecular biology and materials science. M icroelectronics enabling more and more powerful yet shrinking chip geometries has teamed up with biology, which in turn has increasingly succeeded in mapping out the human genome and harnessing the potential of genetic data.

In the meantime, the relationship of microelectronics and biology is no longer a purely scientific one. In fact, their liaison has yielded initial commercially useful results. One example is the biochip, whose potential is said to be extremely promising. Biochips actually represent a collective term which conceals tiny laboratory-like structures. Specified bio-molecules, particularly D NA or proteins, are analyzed on a miniaturized solid substrate.
has been borrowed from the semiconductor industry. Both a microchip and biochip embody an enormous information density. Whereas the computer chip contains a multitude of integrated circuits and information, hundreds of genes or proteins are arranged in a micro-array, similar to the form of a chessboard. Every single spot corresponds to a conventional analysis carried out in a test tube. Using chip as a name also justifies the method of production, increasingly based on semiconductor technologies.

The world's first biochip enables the simultaneous testing of up to 400 genes

Infineon ranks among the pioneers in this field - for example, with the world's first biochip which is not made out of glass or plastic, but rather silicon, the proven basic material of the semiconductor industry. At the end of $M$ arch, Infineon became the first firm to roll out a complete solution based on a 3D flow-thru chip. Developed in collaboration with the U.S. company M etriG enix, it is designed to primarily test new medicines. Tiny pores, each 10 micron
in size, are etched into the silicon. Up to 400 genes can be analyzed simultaneously on a surface area of only one square centimeter.

Take the case of researchers trying to develop a new active agent to combat breast cancer. DNA which has been altered in a way characteristic to this disease is added to the chip. Like the one side of an opened zipper, half of a DNA double helix is pumped in the pores. The probe material is then treated with a potential active agent. Similar to the principle of putting a key in a keyhole, the gene segments of the sample will bind to the probe material (hybridization), providing there is a matching segment. An optical test will determine whether the zipper in this analogy has actually been closed well. A luminescent dye is added that will only bind to the matched genes. It emits a detectable, fluorescent light in green, red and yellow, which is captured by a precision camera and forwarded to a computer. The light pattern of the heal thy and the treated samples are compared on the screen. If the two match, the active agent is judged to be effective against breast cancer.

The Infineon chip functions on the basis of an innovative three-dimensional micro-array. A network of fine micro-channels populates the entire chip, from top to bottom. The sample material is repeatedly

E arlier, researchers required years of laboratory tests to determine the function of genes. Biochips now enable a large quantity of genes to be analyzed simultaneously. It is not a coincidence that the word "chip"

The U.S. company MetriGenix together with Infineon developed the complete flow-thru chip solution. It consists of a hybridization unit (left), an evaluation apparatus (bottom right) with an integrated high-sensitivity camera as well as biochips which are contained in a cartridge (picture, above right), through which the substances to be analyzed are delivered to the chip.


## Computer Chips Сommunicate with Nerve Cells

The following scenario may sound like science fiction, but it is very real indeed. Individual nerve cells are isolated and then added on to a chip. They grow together to form a network of neurons which can be kept alive over a period of several weeks. Thus, a hybrid system consisting of a semiconductor chip and neurons is created. This is exactly what Infineon researchers and scientists at the Max Planck Institute for Biochemistry in Munich succeeded in achieving with the nerve cells of a snail. They managed to apply a total of 16,384 high-sensitivity sensors to a chip area of one square millimeter. These sensors amplify the weak electrical signals of the neurons - which have a maximum of five millivolts. The signals are then transferred to a compu-
ter system for processing.

With the help of this data, neurobiological researchers can analyze how associated group cells or individual cells respond to electrical stimulation or specific substances over a defined period of time. The scientists hope to gain valuable new insights into the neuron jungle in the human brain. More than 100 billion nerve cells are continually exchanging information. Understanding the principles of how they operate and interact could be a first step towards unraveling the secrets of diseases afflicting the brain which are still incurable today.

pumped back and forth through the pores (flow-thru method). This shortens hybridization time, and makes the test more sensitive and precise in comparison to planar methods. Furthermore, it reduces the consumption of test material and reagents. The complete systems solution, called "4D Array System," is priced at around 60,000 Euro. It not only includes the chips but al so the evaluation apparatus with its high-sensitivity CCD (C harged C oupled D evice) camera. For the pharmaceutical industry, the investments are offset by massive savings. Today, the development of a new drug requires an average of 12 to 15 years. The biochip reduces the time to develop a new drug by one to two years. The successful launch of a widely used medication is worth up to 500 million Euro in annual revenues.

The biochip with a surface of one square centimeter can al ready make a major contribution, not only to drug development but as a diagnostic tool. Flow-thru biochips enable the study of inflammation,
breast and lung cancer, as well as neurological diseases such as Alzheimer's, Parkinson's and multiple sclerosis. In the near future, standardized systems will be available to enable the study of liver disorders, apoptosis (programmed death of cells) and cardiovascular diseases. In addition to these standard solutions, chips could be configured according to individual customer specifications, making possible the implementation of paternity tests or research into food. F urthermore, the chips will potentially allow for forensic investigations and medical diagnostics, for example of a person's susceptibility or resistance.

Biochips could dramatically transform the work carried out in pharmaceutical research laboratories

As if all this was not enough in itself, Infineon researchers are working on a system enabling a single blood test to evaluate the effectiveness of a medication in fighting particular diseases, determine potential side effects or predict reaction
times. This will especially facilitate the treatment of patients with high blood pressure or those suffering from depression. In these cases, time is a crucial factor in the therapeutic process.

## Biochips could potentially transform

 the work being carried out in pharmaceutical research laboratories just as dramatically as the personal computer changed the computer business two decades ago. Everything is becoming smaller, faster and more cost-effective. Analysts for the Freedonia $G$ roup expect an annual growth of 32 percent in the market for biochips and related products. Infineon provides all the core components required to produce large volumes of high-quality chips at a favorable price. Systems solutions are to be developed together with partners from the pharmaceutical industry, enabling Infineon to play a leading role in this future-oriented market.For more information, refer to www.infineon.com/bioscience

# Staying ahead of the hog cycle 

How Infineon is preparing to win the tough race between the rabbit and the hedgehog in the memory chip market. Interview with Harald Eggers, head of the Memory Products Group.

Whenever Infineon's latest business results are available for evaluation, one quickly focuses on the latest developments in the memory products market as well. How extensive is the company's business with chips, and why does it have such a major impact on the company's performance?

Harald Eggers:
Infineon achieves between 30 percent and 40 percent of its total revenues in the memory chip segment. By far, the vast portion of memory capacity (megabits) which is sold, namely 70 percent, is built into PC s. Another 20 percent is attributed to computer infrastructure, such as servers and mainframe computers, whereas graphic and mobile applications such as Personal Digital Assistants account for the remaining 10 percent. However, the D RAM market for PC s is extremely volatile, characterized by cyclical fluctuations in which supply and demand regularly diverge from each other. On the demand side, we are confronted with the so-called "Replacement C ycle." In this case, companies are expected to invest in new computers every three to four years. The last large-scale investment boom occurred shortly before the year 2000, when the feared Y 2 K problem led to massive computer investments. In the meantime, we believe there are signs that a new replacement cycle will begin in the second half of the year 2003. The second cycle to consider concerns private demand, which fluctuates on a seasonal basis. For example, each year, C hristmas shopping leads to strong quarterly results for us. On the demand side, it must also be added that memory size is no Ionger as important a factor in computer performance as it once was. C omputer manufacturers have calculated that the prices for
the memory chips built into computers make up 5 to 6 percent of the total computer price. Depending on the price, they integrate more or fewer chips into the devices. The supply side primarily depends on how much the semiconductor producers have invested. In this regard, one can say that we were in the midst of a competitive footrace in the year 2001. In other words, there was a definite oversupply, resulting from the investments in the chip sector made in the years 1999 and 2000, which, in turn, collided with a long-lasting period of weak demand. This can be attributed to the cyclical fluctuations, on the one hand, but also to the general economic downturn.

Nevertheless, the mechanisms in the semiconductor industry seem to be somewhat predictable. Can't one simply break out of this kind of closed loop, and have Infineon adopt an anti-cyclical strategy, investing when the market is weak?

Harald Eggers:
Within limits. It would mean investing precisely at the time one has no money, after incurring losses due to lower prices. But in fact we did just that. We were the first company in the world to initiate volume production of 300 mm wafers at our facility in D resden. And we achieved this in the most difficult of periods, economically speaking. In the meantime, our production is much more cost effective than conventional 200 mm wafers. Approx. two and half times as many chips fit into an area the size of a pizza, making our production costs up to 30 percent below conventional technologies. Furthermore, we have a solid edge in the competitive race to "shrink" chip geometries. Increasingly smaller chip structures mean chip sizes are continually
decreasing. This improves our cost position and makes us a more attractive player.

What consequences does this have for Infineon's competitive standing?

## Harald Eggers:

O ne must consider the fact that D RAM chips are categorized as "commodity products." This means that they have the same basic technical parameters. C hips from different producers do not differ, and are thus interchangeable with each other. The consequence is that a semiconductor manufacturer can hardly stand out on the basis of quality, but mainly on the basis of efficiency and logistics. This is why an enormous technological rat race arises to develop the best and most favourable production methods.

Is this a race, in which more and more runners get left behind?

## Harald Eggers:

That is precisely what is happening. At the moment, the top 10 companies account for 95 percent of all DRAM -chips worldwide. Infineon ranks third at present. But more and more manufacturers are unable to keep up with the pace of technological developments. O ur favourable cost position has boosted the leeway we enjoy, and we posted revenue growth in the last fiscal year. In contrast, other companies are quickly running out of steam. Due to heavy losses, they have cut investments and even closed down facilities. But the real consolidation phase has yet to take place, and it is evolving quite slowly. It is a fact that investments or the lack of investments in this market first have a noticable impact after around two years. Therefore, the next shortage is inevitable, and Infineon has
created some flexibility for itself for this kind of situation. We expect our market share to climb to 20 or 25 percent by the year 2005, whereas the number of major players in the market could decrease to as few as four producers.

Hasn't Infineon recently concluded a whole series of cooperation agreements with other chip manufacturers, primarily in Asia?

## Harald Eggers:

These partnerships also represent a means of counteracting cyclical fluctuations. Our pioneering accomplishments in 300 mm technology, good customer relationships and low production costs certainly make us an attractive partner. We either transfer our technologies, e. g. in the case of Semiconductor M anufacturing International Corporation (SMIC) to C hina, or license them, as we do with Taiwan's chip
producer Winbond. In return, we ensure our exclusive rights to the chips produced using these technologies. In this way, we expand our production capacity for periods of increasing demand. At the same time, we are more flexible in coping with market downturns. Furthermore, we share investments and developmental risks with our partners. This applies to the developmental and production collaboration with $N$ anya, the Taiwanese DRAM -chip manufacturer. In the future, we do not want to greatly expand our own production. Rather, we will increasingly rely on those companies which can offer more cost-effective, flexible structures. Technological development will continue to be our top priority. For instance, we have an innovation group to ensure that we remain in the forefront and on the cutting edge, taking advantage of promising trends.

Even if the market recovers, there is no doubt that there will be yet another crisis in the semiconductor industry in the future. Is Infineon ready to deal with it?

Harald Eggers:
We expect to be one of the winners of the consolidation process, and operate as a leader among the few remaining semiconductor producers. At that point, we will leverage our position to gain added clout on the marketplace and broaden our product portfolio to achieve better margins. The fact that we won market share during the current economic downswing demonstrates the success of our strategy. In addition, we are focusing on technological development and outsourcing additional production capacities. In conclusion, we should be well-prepared for the future.

## Cyclical Fluctuations (called the

"hog cycle" in German):
Supply and demand do not converge. Excess supply leads to declining prices and growing inventories. Production is then cut back, the companies post losses and curtail investments. The resulting shortage is accompanied by rising demand and prices. Production climbs, as do investments in manufacturing capacity, until there is an excess in supply once again. The whole cycle begins from scratch. This phenomenon was actually first described in a market for pig meat.


Infineon is "Official Supplier" of the Scuderia Ferrari Marlboro Formula 1 Team. Infineon engineers will cooperate with Ferrari on electronic engine control systems, telemetric systems, electronic power distribution, sensor technologies and highspeed measuring systems.

## Infineon is "Official Supplier" of Ferrari's formula 1 Team

nfineon has concluded a wide-ranging technical cooperation agreement with Ferrari SpA. Infineon now serves as official supplier of the Scuderia Ferrari M arlboro Formula 1 Team. According to the terms of the agreement, Infineon will contribute its leading technologies in automotive electronics as well as a team of experienced motor sport engineers during the ongoing race season. They will provide state-of-the-art expertise in the areas of electronic engine control systems, telemetric systems, electronic power distribution, sensor technologies and high-speed measuring systems. The partnership with Ferrari also provides Infineon with bottom-line advantages. It will enable Infineon to develop technologies setting new standards in automotive electronics. In addition, the ideas and experience gained from this collaboration can be applied to future product developments. Infineon's Automotive and Industrial G roup has posted record results in each of the last five quarters. Today, every third automobile worldwide and every second car in E urope already has an Infineon chip in the engine controller.

## Infineon Accelerates Corporate Restructuring

nfineon continues to focus on achieving extensive savings as the basis for returning to profitability as soon as possible. In the last fiscal year, Infineon launched Impact and Impact 2, two cost-cutting initiatives which have al ready resulted in savings amounting to 2.8 billion E uro. The ongoing drive will lead to further cost reductions of 500 million E uro, 50 million E uro of which will apply to the current fiscal year. In the upcoming months, 500 jobs will be pruned in various central functions, and another 150 in the Secure M obile Solutions G roup. An additional 250 job cuts will be achieved through transfers or outsourcing. Infineon is also striving to decentralize its structures in order to operate even more efficiently. The Automotive and Industrial G roup will be managed from Villach, Austria in the future, where its production and research facilities are already located. W ithin the framework of the Agenda 5-to-1 program, the company's regional presence in the U SA and Asia will be further strengthened. In Singapore, the foundation stone for a new building belonging to Infineon's future Asian headquarters was laid in April. Infineon plans to establish a new business location on the eastern coast of the USA in addition to its current facility in San Jose, C alifornia. In order to reduce costs, Infineon is also considering the potential relocation of its corporate headquarters in M unich to another country. Various sites are being evaluated in Asia, the USA and E urope, including Switzerland. According to U Irich Schumacher, President and CEO of Infineon, all these measures serve to achieve one overriding goal, namely the return to profitability. Further information is available on the Internet at: www.infineon.com/news

## Matthias Poth Appointed New Head of Corporate Center

$I^{16}$February of this year, M atthias Poth (38) assumed responsibility for managing Infineon's C orporate C enter (C PC ). With 250 employees, C PC encompasses eight areas, from Business D evelopment to Strategy as well as the C enter of Organizational Excellence, Security, M obility and Service, Processes and C ulture, Relationship M anagement and Intellectual C apital. The appointment of $M$ atthias Poth underlines the drive towards transforming C PC into a newly organized and more service-oriented division. Three additional departments, namely C ommunications, Branding \& M arketing as well as Investor Relations, were also integrated into the C orporate C enter.


# Joint Venture Paves the Way for Expansion Into Burgeoning Flash Memory Market 


#### Abstract

nfineon Technologies Flash $G \mathrm{mbH} \& \mathrm{Co}$. KG is the name of the new joint venture established in collaboration with Saifun Semiconductors of Israel. The aim of the joint venture, based in D resden, G ermany, is to significantly expand the business for non-volatile memory products. M arket research companies forecast 10 percent annual growth in the worldwide market for flash memory up to 2006. Infineon Flash stems from the Ingentix joint venture set up with Saifun in 2001 to focus on developing data flash memory products. G rowth expectations are primarily based on the increased application of flash memories in mobile phones as well as increasing demand for portable devices (e. g. M P3 players) and digital cameras with portable and integrated memories, which retain their contents even without voltage. The joint venture will enable Infineon to integrate DRAM and flash memory expertise in new and innovative product generations. In line with its Agenda 5-to-1, Infineon will also be able to position itself even more as a systems solution provider. Volume production of the first data flash memories is scheduled to begin in the second half of 2003, the first program flash memories at the beginning of 2004.


## Outstanding Achievements of Infineon Researchers

nfineon researchers presented numerous technological breakthroughs at the recent International Solid State C ircuits C onference (ISSC C 2003). At this global forum featuring the latest advances in semiconductors and system-on-chips, Infineon presented the advances made in new applications for CM OS chip technologies, including biochips, flexible organic circuits and smart textiles. Furthermore, Infineon presented its innovations in the field of high-speed communications on the basis of Silicon Germanium transistors. A new standard for chip-to-chip communications was set with the development of multiplexer/demultiplexer circuits achieving data rates of up to $40 \mathrm{~Gb} / \mathrm{s}$ on a single wire.

## Prototype for Chip Structures Under 50 Nanometer

nfineon has installed a prototype of the first commercially available EUV laboratory exposure system into a cleanroom at the company's own research facility in E rlangen, Germany. E UV stands for Extreme Ultra Violet and describes a new kind of lithography process designed to enable the production of future chip generations with structures of 50 nm and below. The EUV lithography operates on the basis of extreme ultraviolet wavelengths of only 13.5 nm , far below the wavelengths of traditional optical light sources, for example 193 nm used today. The laboratory system, developed jointly with AIXUV, a spinoff of the Fraunhofer Institute for Laser Technology, is based on a gas discharge Iamp, which emits E UV radiation in the spectral range of 9 to 20 nm . It represents a milestone in the process development of EUV technology, and is considered the preferred process when it comes to further shrinking chip structures. According to international prognoses volume production based on the 50 nm technology is expected starting in the year 2007.

## QUANTUM LEAP IN Performance: New VDSL Chip-Set with High Data Rates

The next generation VDSL chip-set VDSL5100 unveiled by Infineon represents a major technological advance without additional costs to users. The newlydeveloped chip-set is suitable for all VDSL applications, supporting both E thernet as well as ATM over VDSL. The product has significantly improved data rates. Thanks to a faster internal data clock and the benefits of the 0.13 micron processing technology, this fifth generation of QAM VDSL chips produced by Infineon achieves aggregate data rates surpassing 100 M b/s. The high performance enables service providers to offer a broader range of high bandwidth services, such asfilms, highdefinition television and games.

# Infineon Repeats Market Share Gains 

## Quarterly Results: Decline in Memory Prices Negatively Impacts EBIT

n the second quarter of the 2003 fiscal year, Infineon boosted its revenues to 1.48 billion E uro, a rise of 3 percent compared to the first quarter and 13 percent year-on-year. G rowth was primarily driven by increased sales of memory products, as well as the repeated record performance of the Automotive \& Industrial G roup. Once again, Infineon succeeded in gaining further market share despite the ongoing difficult market environment.

H owever, despite productivity gains, total net loss increased to 328 million E uro compared to a net loss of 40 million Euro in the previous quarter and 108 million E uro in the second quarter of the previous fiscal year. This was due to the strong downward pressure on prices for memory products as well as in other segments, which once again negatively impacted Infineon's performance. The quarterly net loss includes a valuation allowance for tax losses incurred of 103 million E uro, as already announced in the previous two quarters. The net loss also reflects exceptional effects amounting to 54 million Euro, related to inventory write-offs, non-recurring licensing income, restructuring charges and acquisition-related expenditures. Without these exceptional effects, the net loss would have totalled 171 million Euro.

The quarterly loss per share amounted to 0.45 E uro, compared to a loss per share of 0.06 E uro in the previous quarter and 0.16 E uro per share year-on-year. E BIT (earnings before interest, minority interest and taxes) in the second quarter of the 2003 fiscal year amounted to a loss of 223 million Euro, compared to a loss of 31 million Euro in the first quarter and a loss of 176 million E uro in the second quarter of the 2002 fiscal year.

Expenditures for research and development amounted to 254 million E uro, or 17 percent of revenues, a slight decline from 265 million E uro in the previous quarter. Selling, general and administrative expenses (SG \& A) once again decreased, to 164 million E uro or 11 percent of total revenues. This was down from SG \& A expenses of 172 million E uro in the previous quarter, or 12 percent of total revenues. Infineon's gross cash position amounted to 1.5 billion E uro, down sequentially from 1.6 billion E uro. Free cash flow from operating and investing activities, excluding the purchase or sale of marketable securities, improved to a minus of 90 million Euro, compared to a minus of 362 million Euro in the previous quarter.

Infineon achieved 56 percent of its revenues outside of Europe, up from 55 percent in the previous quarter. This reflected increased sales in Asia, in particular Japan. As of M arch 31, 2003, Infineon had 31,200 employees worldwide, of which 5,500 are engaged in research and development. Looking at the

Regional Revenues in percent
For the 2nd Quarter 2003


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Germany
Other Europe
    America (N AFTA)
    Asia/Pacific
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Revenues by Segment in Euro millions For the 2nd Quarter 2003


C ommunications: 488 million euros
Automotive \& Industrial: 354 million euros
M emory Products: 609 million euros
$\square$ O ther O perating Segments, Corporate and Reconciliation: 33 million euros
results for the first half of the 2003 fiscal year, total revenues amounted to 2.93 billion Euro, up 28 percent compared to 2.28 billion Euro in revenues posted during the first six months of last year. $N$ et loss amounted to 368 million in the first six months, compared to a net loss of 439 million Euro year-on-year. The tax expense for the first half year includes a valuation allowance for tax losses of 125 million Euro, in accordance with US GAAP. EBIT for the first half of the 2003 fiscal year amounted to a loss of 254 million Euro, an improvement from an EBIT loss of 735 million Euro year-onyear.

The Automotive and Industrial G roup once again posted record quarterly revenues, reaching an all-time high of 354 million Euro, an increase of 6 percent sequentially and 18 percent year-on-year. The increase resulted primarily from higher sales volumes in automotive power chips as well as power management and supply products. EBIT improved to 49 million Euro, compared to 44 million Euro in the previous quarter and 24 million Euro in the first six months of the 2002 fiscal year. This was mainly due to improved productivity as well as the further conversion of chip production to 200 mm silicon wafers. Infineon boosted its market share for power management and supply applications in Asia, particularly for computers. The company also improved its market position in automotive power applications, particularly in the powertrain and convenience segments.

The Wireline Communications G roup increased its revenues to 112 million Euro, up 6 percent sequentially and 17 percent year-on-year. Asia was the driving force for revenue growth in this segment as well, particularly due to higher volume sales for broadband access technologies such as E thernet over VDSL access technology and next generation ADSL technology for central office applications. Growth on the

SELECTED CONSOLIDATED STATEMENT of operations data

FOR THE 3 MONTHS ENDED DEC. 31, 2002 MAR. 31, 2003

|  | in E uro millions |  |
| :--- | ---: | ---: |
| N et sales | 1,441 | 1,484 |
| C ost of goods sold | $-1,039$ | $-1,283$ |
| G ross profit | $\mathbf{4 0 2}$ | $\mathbf{2 0 1}$ |
| Research and devel opment expenses | -265 | -254 |
| Selling, general and administrative expenses | -172 | -164 |
| Restructuring charges | -1 | -10 |
| Other operating income (expense), net | -7 | - |
| O perating loss | $\mathbf{- 4 3}$ | $\mathbf{- 2 2 7}$ |
| Interest (expense) income, net | 1 | -11 |
| Equity in (losses) earnings of associated companies | 16 | 7 |
| Other expense, net | -4 | -3 |
| M inority interests | 2 | 2 |
| Loss before income taxes | $\mathbf{- 2 8}$ | $\mathbf{- 2 3 2}$ |
| Income tax benefit (expense) | -12 | -96 |
| Net loss | $\mathbf{- 4 0}$ | $\mathbf{- 3 2 8}$ |
| Weighted average of outstanding shares - |  |  |
| basic and diluted | 721 | 721 |
| Loss per share - basic and diluted | $\mathbf{- 0 . 0 6}$ | $\mathbf{- 0 . 4 5}$ |
| E BIT | $\mathbf{- 3 1}$ | $\mathbf{- 2 2 3}$ |

Asian market reflects the successful realignment of Infineon's product portfolio. EBIT also improved to a loss of 39 million Euro from a loss of 42 million Euro in the previous quarter and a loss of 66 million Euro in the second quarter of the 2002 fiscal year. This improvement can be primarily attributed to cost reductions. Infineon introduced its new product family of intelligent fiber optics transceivers and shipped first engineering samples of the innovative 10G XPAK transceivers to leading customers in the fiber optics market.

The Secure M obile Solutions G roup posted a 9 percent decline in revenues to 376 million Euro, primarily due to the anticipated seasonal drop in demand for
mobile phones following the C hristmas season. H owever, revenues were up 27 percent compared to the second quarter of last year. Due to increased productivity, EBIT improved to a loss of 23 million Euro from a loss of 28 million Euro during the previousquarter and a loss of 37 million E uro in the first six months of the 2002 fiscal year. The EBIT loss can be mainly attributed to lower sales volumes for cellular handsets and wireless infrastructure, as well as strong downward pressure on prices for silicon discrete components and security controllers. At the same time, Infineon maintained a high level of investments in research and development for software and complete reference designs, in order

| bALANCE SHEET DATA | AS OF |  |
| :---: | :---: | :---: |
|  | SEPT. 30, 2002 | mar. 31, 2003 |
| Assets | in E uro millions |  |
| C ash and cash equivalents | 1,199 | 633 |
| M arketable securities | 738 | 842 |
| Trade accounts receivable, net | 758 | 735 |
| Inventories | 891 | 957 |
| C urrent assets | 4,191 | 3,863 |
| Property, plant and equipment, net | 4,491 | 4,248 |
| Total assets | 10,918 | 10,227 |
| Liabilities and shareholders' equity |  |  |
| Short-term debt and current maturities | 120 | 109 |
| Trade accounts payable | 1,197 | 858 |
| C urrent liabilities | 2,383 | 2,120 |
| Long-term debt | 1,710 | 1,698 |
| Total liabilities | 4,760 | 4,526 |
| Total shareholders' equity | 6,158 | 5,701 |

to enable the company to increasingly provide systems solutions. Infineon introduced a complete UM TS/EDGE solution at the 3G SM World C ongress. During the course of the third quarter, the strategic partnership Infineon concluded with Agere to develop fast wireless networking solutions plans to ship the first engineering samples of the most highly integrated dualband multimode solution for WLAN systems. In the growth market for Bluetooth chips, Infineon has al ready shipped more than 20 million units.

The M emory Products G roup posted revenues of 609 million Euro in the second quarter, a significant improvement of 12 percent sequentially and 4 percent year-onyear. This includes previously deferred licensing income of 60 million Euro. In contrast, EBIT amounted to a loss of 138 million Euro, compared to a positive EBIT of 29 million E uro in the previous quarter and a loss of 33 million Euro during the second quarter of the 2002 fiscal year. The quarterly loss includes an inventory writedown of 128 million Euro for memory products. Infineon succeeded in boosting productivity, particularly for memory products.

This is based in particular on 300 mm production at the company's $D$ resden facility, which has achieved more than 6,000 wafer starts per week. These achievements could not compensate for the strong price decline for memory products. For example, the market price for 256 M b D DR modules, the product with the largest sales volume, dropped from a level of USD 6 in January 2003 to a low of under USD 3 at the end of February. The price of these modules improved to slightly above USD 3 at the end of the second quarter. (Source: DRAM Exchange). Infineon expanded its manufacturing partnership network, concluding an agreement with Semiconductor M anufacturing International C orporation (SM IC) in C hina. Infineon will license its 0.11 micron DRAM trench technology and its 300 mm production know-how to SM IC. In return, the company's overall production capacity will climb by approx. 58,000 wafer starts per month, as soon as volume production at SM IC is fully ramped up. This is expected to occur in 2005. Furthermore, Intel validated Infineon's D DR-I 400 module platform ( $128 \mathrm{M} \mathrm{b}, 256 \mathrm{M} \mathrm{b}$ and 512 Mb ) in the course of the second quarter.

SELECTED CONSOLIDATED
CASH FLOW DATA
FOR THE 3 MONTHS ENDED DEC. 31, 2002 MAR. 31, 2003
in E uro millions

|  | in Euro miliions |  |
| :--- | ---: | ---: |
| Net cash (used in) provided by operating activities | 4 | 101 |
| N et cash used in investing activities | -340 | -323 |
| Net cash provided by (used in) financing activities | -12 | 4 |
| D epreciation and amortization | 353 | 359 |
| Purchases of property, plant and equipment | 309 | 230 |

# Launch of Convertible Bond to Further Strengthen Infineon’s Financial Position 

0n April 30, 2003, Infineon Iaunched a seven-year subordinated convertible bond issue. The volume of the issue is 700 million Euro. The bond is convertible into up to 68 million shares of Infineon Technologies, or can be paid back in the form of an equivalent cash amount or an equivalent cash/share combination at the company's discretion. The bond, placed through the company's D utch subsidiary Infineon Technologies H olding B.V., cannot be called for the first three years of the life of the security. The company is taking advantage of attractive financing conditions prevalent in the current convertible bond market, resulting from the low interest rates and high volatility of stock market prices. The transaction is being managed by G oldman Sachs International and M organ Stanley, which will place the subordinated convertible bond issue with institutional investors outside of the U.S.

## Convertible Bond*


#### Abstract

The issuer entitles the investor to a conversion privilege, i. e. to convert the bond issue into common stock of the company within a specified deadline, when applicable under specified conditions and at a specified conversion ratio. As the conversion privilege is not linked to a legal conversion requirement, the investor has the opportunity - if the value of the company's stock rises - to benefit from and participate in the increased value and earning power of the company. If the share price declines, the subscriber to the bond can waive the option to exchange the bond for shares in the company, and receives the fixed interest on the bond. Due to the advantages which the conversion privilege bestows, convertible bonds generally pay lower interest rates than normal bonds.


A special form of convertible bonds is the optional bond. In this case, the obligations arising in connection with the convertible bond still continue to exist, even when the subscriber exercises the conversion privilege in connection with the stock warrant attached to the convertible bond issue.

* Source: www.boersenlexikon.de (German only) - The Web site also provides additional definitions of financial terms.


## Infineon Expands Automotive Sensor Business

nfineon aims to become the world market leader in the tire pressure sensor segment on the basis of its planned friendly takeover of SensoN or ASA, a leading provider of tire pressure and acceleration sensors. To achieve this goal, Infineon made a takeover bid to the shareholders of SensoN or, headquartered in H orten, N orway, on M ay 20, 2003. At the same time, SensoN or is implementing a capital increase for cash, and is issuing new shares to Infineon. Infineon will pay approx. 48 million Euro to conclude the transaction. "With this step, we are resolutely pursuing our stra-
tegy of further strengthening our leading position in the automotive sector, and will double our market share in automotive semiconductor sensors to approx. 15 percent.," according to Reinhard Ploss, head of Infineon's Automotive and Industrial Electronics G roup.

M arket researchers forecast annual growth in the automotive sensor segment of up to 20 percent annually. Sensors checking tire pressure are the driving force behind the growth in the market. Regulations in this area will require automobile manufac-
turers to equip approx. 10 percent of all new vehicles registered in the U.S.A. with tire pressure monitoring systems as of the end of 2003. This level will increase to approx. 35 percent in 2004 and 65 percent in 2005. The pressure sensors produced by SensoN or have al ready been fully qualified by leading car manufacturers, with whom long-term supply agreements have been concluded in many cases. SensoN or was established in 1985, and employs 170 people.

## Outlook for the 2nd Half of the 2003 Fiscal Year Until September 30

The global economic environment continues to be unfavorable. For this reason, it does not allow for accurate economic forecasts. The last three months have been characterized by a positive development in demand in most business segments. Infineon expects this trend to continue in all its key target markets. To counteract the ongoing downward pressure on prices, Infineon is focusing on boosting productivity, reducing costs and implementing restructuring programs as well as the new Agenda 5-to-1 corporate strategy. For its Secure M obile Solutions G roup, Infineon expects a further moderate increase in demand for GSM /GPRS mobile handsets, which is likely to have a positive effect on
demand for Bluetooth products. Infineon anticipates a continuing difficult market environment and strong pressures on prices in the market for silicon discrete products. Industry analysts forecast a 5 percent decline in worldwide capital expenditures for wireline telecommunications infrastructure in the year 2003, although there will be regional differences, for example moderate growth in Europe. Infineon anticipates ongoing pressure on prices in its fiber optics business, which will be accompanied by growing demand for broadband access technology (AD SL, VDSL). The pricing pressure will also continue in the markets for automotive electronics and automotive semiconductors. N evertheless, Infineon

Relative Performance of the IFX Share Since the Beginning of the 2003 Fiscal Year (on the basis of weekly closing prices, smoothed)


October 1, 2002
M ay 9, 2003

|  | INFINEON TECHNOLOGIES (XETRA) |  |
| :--- | :---: | :---: |
| HIGH | NOV. 6, 2002 | 12,08 EURO |
| LOW | OCT. 9, 2002 | 5,03 EURO |
| FINAL | MAY 9, 2003 | 6,68 EURO |


| DAX (XETRA) |  |  |
| :--- | :--- | :--- |
| HIGH | DEC. 2, 2002 | $3.476,83$ |
| LOW | MAR. 12, 2002 | $2.188,75$ |
| FINAL | MAY 9, 2003 | $2.956,59$ |

## Note:

This document contains forward-looking statements and forecasts based on assumptions and estimates made by Infineon management. While we assume that the expectations of these forward-looking statements are realistic, we cannot guarantee that the expectations will prove to be correct. The assumptions may conceal risks and uncertainties which may lead to actual results significantly divergent from those made in the projective forecasts. The factors that can cause such a divergence include: changes in the economic and business environment, forex and interest rate fluctuations, the launch of competing products, insufficient acceptance of new products or services, and changes in corporate strategy. No update of the projected forecasts by Infineon is planned, nor does Infineon assume any obligation to do so.
expects to achieve additional gains in market share, due to further improvements in productivity combined with a strong portfolio for automotive power and power management as well as power supply products. At the beginning of the third quarter of the current fiscal year, Infineon recognized a strong increase in demand for memory products on the part of Original Equipment $M$ anufacturers. However, visibility for the DRAM market remains low.

Status: April 22, 2003

## INFINEON CALENDAR

## - July 22,

2003

Publication of results for the 3rd quarter and the first nine months (to 30 June) of the 2003 fiscal year

■ November 19, Annual press conference
2003 2003. Publication of preliminary results for the 2003 fiscal year including the $4^{\text {th }}$ quarter (to 30 September 2003)

- January 20, 2004

Annual Shareholder's Meeting, Munich

Fairs and Exhibitions

- November 8,

2003
Munich Stock Exchange Day 2003, Munich

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