



MEMS companies are progressing in the value chain

In the last few months, a new phenomenon has occurred in the ever-moving MEMS business landscape. Instead of having a business models targeting the manufacturing of chips only, new MEMS players are climbing the value chain to provide modules and sub-systems, based on these chips. Three examples of companies which have already assumed this business model are: SiTime which provides ultra stable mechanical oscillators to be integrated into standard silicon chips, Knowles Acoustics for Si microphones and acoustic modules and several companies for IMU modules.

This is not so surprising upon reflection. It is well known that the real value is for the module based on the MEMS chip, rather than the chip only. MEMS manufacturers are struggling to make money, and newcomers have realized that providing modules might be a more profitable way to make money with MEMS technologies. Indeed, it generally needs a long incubation in an R&D center for MEMS manufacturers before being independent and foundries also need to have enough cash to maintain the investment for 4 to 5 years before going into real production.

Providing modules is an approach which requires having access to a broad range of know-how in design, packaging, electronics ... as well as having access to open MEMS fabs. Thus, trying to capture part of the system value and not selling only wafers is a new business model in the MEMS industry which is to be closely followed.

Dr Eric Mounier
Editor-in-chief

MEMS

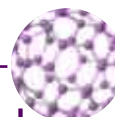
EV Group to supply Nanoimprint Lithography system to NIL Fab



page 8

Nanotechnology

Researchers break a record in magnetic storage



page 15

Optics

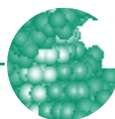
Philips buys out Lumileds as Agilent cashes chips



page 18

Life Science Instrumentation

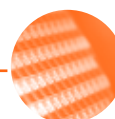
Affymetrix dominates DNA microarray market



page 19

Semiconductors

AMD inaugurates its new 300-mm fab in Dresden



page 23

Contents

Editorial page 1

Yole Index page 3

Special Report pages 4 to 5

2004-2008 Silicon Microphone market analysis: from devices to acoustic modules

MEMS pages 6 to 11

Micralyne expands employee base
The GS3 Panasonic MEMS sensor
Sonion plans production site in Vietnam

Nanotechnology pages 13 to 15

Germany: opening of a Research School for Nanostructures
Nanosys and Sharp collaborate on display
Nanologue: Results of mapping phase on line

Optics pages 16 to 18

Danish start-up grabs Infineon's dilute nitrides
Thomson withdraws from TV

Sensors Unlimited wins \$4.5 million contract
Dow Corning commits to optoelectronics

Life Science pages 19 to 21

Canon's inkjet printer technology will slash price of DNA chips
Microfluidic flow sensor elements developed by Sensirion AG
Exonhit launches splicearray using agilent technologies' microarray platform and collaborate on the Development of blood diagnostics for the early detection of cancers with bioMerieux
Caliper completes acquisition of NovaScreen

Semiconductors pages 22 to 25

Freescale marks one year of 90-nm success and announced plans to start 65-nm in November 2005
Soitec reports record sales for its first half financial year
Worldwide equipment industry Book-to-Bill of 1.03 in September
Danaher completed the sale of Leica Microsystems

Yole Life page 26



Managing Editor: Jean-Christophe Eloy - Editor in chief: Dr. Eric Mounier - Editorial secretary: Dr. Eric Mounier Editors: Dr. Eric Mounier, Jérôme Mouly, David Jourdan, Romain Verollet, Barbara Pieters -Communication & Business Relations Manager: David Jourdan- Production: Mathieu Quiblier Proofreader: Nick Tasker. Yole Développement: 45, rue Sainte Geneviève, F-69006 Lyon, France - TEL. (33) 472 83 01 80 - www.yole.fr

Micronews is done with ATIP, the Asia Technology Information Program (www.atip.org).

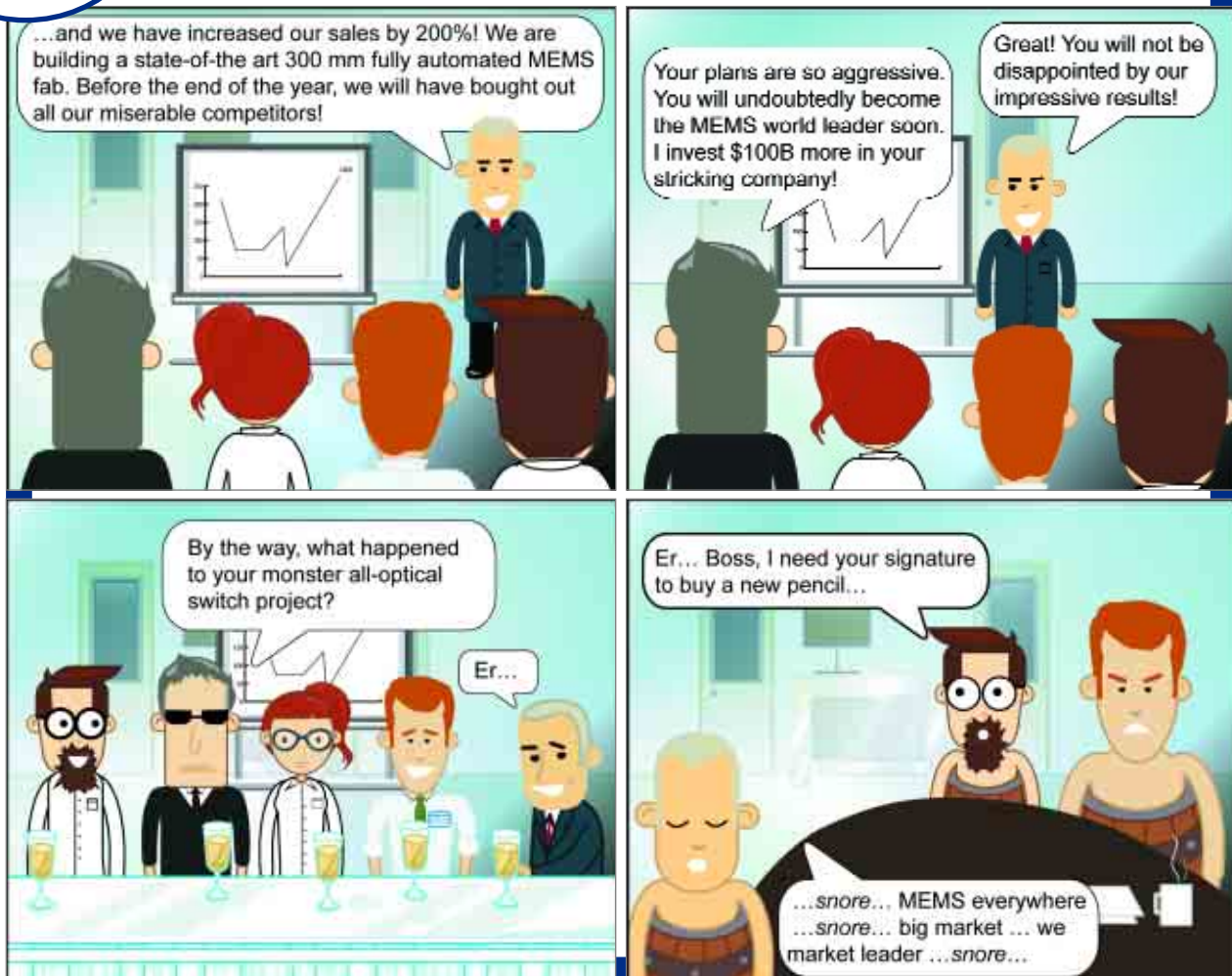
List of companies cited in "Micronews"

MEMS Alphasem, Apogee Technology, Coventor, Matsushita Electric Works (MEW), MEMSCAP, MEMS-Exchange, Micralyne, SEMI, Sonion, STMicroelectronics, VTI Technologies, **NANO** Beijing University, CNRS, EPFL, Georgia Institute of Technology, International Max Planck Research School for, Science and Technology of Nanostructures, Istituto di Struttura della Materia, Molecular Imprints, Nanoco, Nanosys, National Center for Nanoscience and Technology of China, Sharp, Veneto Nanotech Nanofab, University of Manchester **OPTICS** Agilent, Agility Communications, AIST, Alight Technologies, Alphion, Bell labs, Bookham, Cyoptics, Dow Corning, Epistar, Hella, Highwave, Ibsen, Infineon, JDS, Kotura, Lumileds, Marconi, Nozomi, Panasonic, Philips, Photline, Picolight, Samsung Electro-Mechanics, Sensors Unlimited, Thomson, UEC, Vodafone **BIO** 454 Life Sciences, Affymetrix, Agilent, Caliper, Canon, ExonHit, Greiner Bio-One, Illumina, IMT, NSG precision, OGT, Perlegen, Picometrics, Qiagen, Roche Applied Sciences, Scienion, Sensirion **SEMICONDUCTORS** Alphasem, AMD, Danaher, Freescale Semiconductor, IMEC, Leica Microsystems, Nitronex, SEZ, SIA, Soitec, Steag HamaTech, Suss MicroTec, TSMC, VLSI Research

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Yole Index (current stock price)

	Symbol		Total number of shares(M)	Price 01-01-05	Price 20-10-05	Variation year to date	High/Low	Market cap(M) 20-10-05
Material								
Okmetic (SF)	OKM1.F	Eur	16,9	2,42	1,79	-26,0%	2.16/3.10	30,2
Soitec (F)	SOIT	Eur	56,2	5,13	12,00	133,9%	3,71/8.48	674,1
Equipment								
Süss Microtec (D)	SMH	Eur	15,2	5,61	5,48	-2,3%	4,50/10,35	83,1
STS (UK)	SRTS.L	GBP	31,4	0,14	0,15	3,6%	0,10/0,51	4,5
Ultratech (USA)	UTEK	\$	23,7	18,85	14,64	-22,3%	10,99/24,95	346,8
Components								
Memscap (F)	MEMS	Eur	108,0	0,29	0,30	3,4%	0,21/0,39	32,4
Affymetrix (USA)	AFFX	\$	60,3	36,55	44,47	21,7%	24,48/44,72	2681,0
Cepheid (USA)	CPHD	\$	41,7	9,94	6,13	-38,3%	6,16/11,54	255,4
Caliper (USA)	CALP	\$	28,6	7,53	6,61	-12,2%	4,50/8,42	189,1
Elmos (D)	ELG	Eur	19,3	11,80	9,25	-21,6%	10,83/14,78	178,5
Dalsa (CA)	DSA	\$	16,4	20,98	13,05	-37,8%	16,66/24,25	214,4
Motorola (USA)	MOT	\$	2342,1	17,20	20,89	21,5%	13,83/20,89	48926,1
Analog Devices (USA)	ADI	\$	373,8	36,23	35,28	-2,6%	31,36/50,98	13186,8
STM (F)	STM	Eur	901,0	19,32	16,12	-16,6%	16,13/24,82	14524,7
Melexis (B)	MELE	Eur	45,6	9,01	10,50	16,5%	8,35/10,23	478,8



Characters & Story: Éric, Design: Bupla

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November 2005 - n° 41

Special Report

the market, however 50 millions units were shipped in 2004. The other 20 competitors have focused their efforts in advanced technological products winning in die size, integration of arrays, and acoustic modules. Companies who are ready to produce, such as Infineon, Memstech and SonionMEMS (and two other quiet ones) are still fine tuning their products to achieve performance at volume production. These players are likely to ship products before mid 2006, a time at which competition will no longer be exclusively between MEMS microphones and ECM but silicon will be a strong contender. On the other side, ECM manufacturers are trying to catch up by developing advanced devices able to be soldered directly on PCBs and with advanced functions. Price will become a key factor.

Companies' technology will define market position when entering markets

Competition in technology development has lead players to create a variety of technological solutions. It seems that capacitive detection represents the only viable alternative. Microphone device structures can be hybrid or monolithic, single or array, manufactured through MEMS specific or standard-CMOS processes, packaged on standard PCB or stacked. Market pressure is high to achieve the lowest cost structure associated with the competitive advantage of the MEMS design.



Figure 3: Silicon Microphone detection principles

Acoustics business is on spotlight

The acquisition of Knowles Electronics by Dover Electronics is a sign of great interest in the acoustics business which is currently facing strong changes:

- Continuous development of existing applications
- Possibilities with new MEMS devices to evolve from simple silicon microphones to real acoustics modules.

This approach is a key enabler for the integration of MEMS devices in mobile phones and related applications.

In this context, YOLE DÉVELOPPEMENT is editing a new report "Silicon Microphone Market 2005" This report provides a complete analysis of the silicon microphone market, players and technologies with unique features:

- Silicon microphone structures developed for microphone applications
- Key manufacturing process requirements and critical manufacturing steps
- Risk analysis of the existing business model
- Industry development status
- Market evaluation

Yole has released its SIMM05 report from which part of the above information is extracted. If you are interested in knowing more about this report, please contact David Jourdan at +33 472 830 190, jourdan@yole.fr or www.yole.fr

SIMM 05: Silicon Microphone Market 2005

▶ From Si microphone to acoustic modules

Silicon Microphone is one of the very fast growing applications of the MEMS markets. The market adoption from mobile phone suppliers has been very swift from 2004 up to the beginning of 2005. The overall market is forecasted to grow from 60+ Millions units in 2005 to more than 350 in 2008, representing a large part of the mobile phone total available market.

This report provides an analysis of the replacement market for ECM devices as well as an in-depth analysis of other silicon microphone applications.

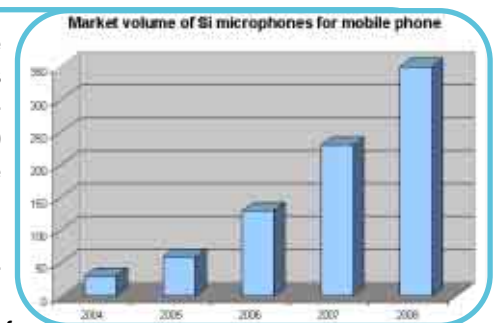
For each MEMS microphone structures under analysis, a description of the features is described and operating principle explained. Yole Développement has identified for each device types the lead developers and the status of development.

In addition to the analysis, the MEMS structures and latest news for each company are described in the new and updated company profiles of the main market players. A specific focus will highlight future products introduction and the upcoming various products families using of the acoustic module approach.

This analysis of almost 100 PowerPoint slides also includes the main market players' profiles.

Price: Euro 3,300 / US\$ 3,950

Contact: David Jourdan, Tel: +33 472 83 01 90, Email: jourdan@yole.fr, website: www.yole.fr







15TH IEEE INTERNATIONAL CONFERENCE ON MICRO-ELECTRO-MECHANICAL SYSTEMS

MEMS 2006

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22-26 January, 2006




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INVITED SPEAKERS:

B. Johan Feenstra
Philips Research Laboratories, THE NETHERLANDS
 Electrowetting Based Displays: Bringing Microfluidics Alive On-Screen

Shunzo Yamashita
Hitachi Ltd., JAPAN
 Key Technologies for Health-Care Sensor-Net System

Meyya Meyyappan
NASA Ames Research Center, USA
 Nanotechnology: An Overview and Integration with MEMS

TOPICS:

- Design, Analysis, and Theoretical Concepts with Experimental Verification
- Materials and Device Characterization
- Fabrication and Packaging Technologies
- Biomedical and Chemical Devices and Systems
- Mechanical and Physical Sensors and Systems
- Actuators
- Micro-Optical Devices and Systems
- Wireless Communications Devices/Systems (non-optical)
- Nano-Electro-Mechanical Devices/Systems
- Power MEMS & Energy Harvesting

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For conference program, registration, and updates, please visit the web-site at: <http://www.mems2006.org>

The GS3 Panasonic MEMS sensor

Matsushita Electric Works (MEW) unveiled at the Taitronics Autumn 2005 trade fair in Taipei its three-axis acceleration sensor GS3, to be sold in international markets under the Panasonic brand name. According to Matsushita representatives, Taiwan based Sampo is planning to utilize the GS3 in its washing machines. The GS3 sensor was released on October 1, together with two other series of ultra-small devices that leverage MEMS technology, with all three products being displayed at the CEATEC Japan 2005 exhibition. MEW calls this product group PIMITES (Precision Integrated Micro Technologies & Systems).

<http://www.mew.co.jp>

SEMI offers the first set of standard terminologies for the MEMS market

The new November 1, 2005 Standards include specifications for epitaxial silicon wafers, test methods for measuring mechanical vibrations in FPD handling equipment, MEMS terminologies, and data matrix symbology for automated identification of EUV lithography masks. These eight new technical standards are applicable to the semiconductor, flat panel display (FPD) and MEMS manufacturing industries. The new standards, developed by technical experts from equipment suppliers, device manufacturers and other companies participating in the SEMI International Standards Program, are available for purchase in CD-ROM format or can be downloaded from the SEMI Web site.

<http://www.semi.org>

ST unveils its new 3-axis accelerometers

STMicroelectronics announced that it has expanded its portfolio of three-axis accelerometers with three new models, embedding world-class performance in ever smaller packages. From ultra-compact analogic devices to "smart sensors" with two digital output formats (SPI/I2C), ST's low-power, high-resolution MEMS accelerometers address different system needs and hardware characteristics in a wide range of low-g applications, from hard-disk drive protection to motion user interfaces. ST's new three-axis analogic sensor is available in two acceleration ranges, the standard +/- 2g for tilt applications, and a dynamically selectable choice of +/-2g and +/-6g suited for measuring both static and dynamic accelerations, such as vibrations or rollover motions.

<http://www.st.com>



Life & Death

Russian strategy about MEMS technology

Russia is pursuing micro electrical mechanical systems (MEMS) technology in an unstructured strategy in which various institutions bring to the technology their own particular technological strengths, said Electronics Weekly in a report. The St. Petersburg Electro-Technical Institute focuses on their material expertise to develop new MEMS. They use silicon carbide and other epitaxial substrates to develop high end MEMS devices. "We have had a MEMS research programme running since 2000," Victor Luchinin, director of microtech-

nology and diagnostics at the university told. "We have developed a MEMS-based silicon carbide sensor for use in nuclear reactors." The programme was funded by a \$600,000 grant from the US Sandia National laboratories. The university helps to fund its MEMS R&D by taking on projects from overseas companies and institutions. A major problem for the university as well as many other Russian companies and institutions was a lack of advanced technology equipment. The institute and other sections of the Russian microelectronics community are now actively seeking research partners to expand and commercialise their efforts.

<http://www.electronicweekly.co.uk>

MEMSentry

Yole Développement is now editing an exclusive bulletin analyzing what has happened & what will happen in the MEMS fields

Benefits for MEMSentry readers:

- Analysis of the last events, news and strategic movements in the MEMS field
- Detailed analysis of a company: facts and figures, but also key trends, technologies and strategies
- Analysis of the latest financial news
- Key access to MEMS Yole Développement expertise with a Q&A session

Typical content of MEMSentry:

- The Analysis of the last news: Highlight the key aspects of the latest news, with a particular focus on industrial strategies, new applications, industry changes...
- What has happened and why? presentation of the evolution of the different industrial companies, last changes and Yole analysis on the impact on the industry
- Last financial and investment rounds: presentation of the last investments in MEMS companies, M&A, exits, new venture rounds...
- Analysis of one application: in each issue, we will analyze a specific application in order to provide market data and present the strategy of the main players involved on this market
- Analysis of one company: in each issue, we will analyze a specific company in term of technologies, products, future developments, but also finance

Coming issues:

	MEMSentry #1	MEMSentry #2	MEMSentry #3	MEMSentry #4
Company analysis	Tronic's Microsystems	Dalsa Semiconductor	VTI Technologies	Asia Pacific Microsystems
Application analysis	3D accelerometer for mobile phone	Gyro for electronic stability program	MEMS based oscillator	Silicon microphone
Analysis of the latest news	X	X	X	X
What has happened and why	X	X	X	X
Last financial rounds	X	X	X	X

Starting date of the publication:

November 2005

Content:

4 to 8 pages, depending on the news

Price:

Euro 450/ \$540 for 18 issues per year

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November 2005 - n° 41



Life & Death

Sonion plans to open production site

Sonion, provider in miniature acoustical components announced plans for a state-of-the-art, 10,000 square meter production and warehouse facility outside of Ho Chi Minh City, Vietnam. The facility is on schedule to be completed by the fourth quarter 2006. The Ho Chi Minh City plant is key to the company's global strategy as it supports

continual double digit growth through innovative and cost efficient solutions. The Ho Chi Minh City facility is designed to produce Sonion's transducers for hearing instruments, professional audio and mobile terminals, including silicon microphones based on MEMS technology, for export to the global market. Part of the production equipment needed will be transferred from Sonion's existing facilities in Poland and China.

<http://www.sonion.com>

Business News

TraciT Technologies expands its staff

TraciT Technologies, a leading provider of advanced thick SOI based materials & technology announced today that Dr Andrew Wittkower, previously President of SOITEC USA, has become a Senior Consultant to the company and will act as its Business Development Advisor. Dr Wittkower will also assist in the expansion of TraciT customer portfolio in the USA and Canada. "TRACIT Technologies is growing. The arrival of Sam Guillaume as Sales Director (previously European Sales Director at Credence) and Jean-Marc Henry as Production Director (previously Production manager and Industrial Engineering Manager at ATMEL-Rousset)

allows us to respond to volume requests from our customers" said Bernard Aspar, CEO of TRACIT Technologies and co-Founder with Jean-François Dunyach. "Andrew Wittkower's expertise in building and developing relationships with strategic customers and marketing new products, will be invaluable as we seek to increase the adoption of our new materials for MEMS and Power IC's devices. He has the experience and customer-focused skills to help TraciT Tech. grow rapidly." "In a short period of time, TraciT Tech. has established itself as a key player in a growing market segment," said Andrew Wittkower. "I look forward to helping TraciT Tech. successfully capitalize on the large market opportunity emerging around these advanced bonded structures."

www.tracit-tech.com

VTI selected by Korean car manufacturers

VTI Technologies has been selected as the supplier of low-g accelerometers for Electronic Stability Control (ESP/ESC) and Active Suspension Systems to the most significant car manufacturers in Korea. The deliveries of VTI's SCA610 and SCA620 series single-axis accelerometers have already started and first cars are rolling out from the assembly lines. VTI supplies low-g accelerometer for four-wheel-drive ABS systems in Korea. This new business for the new application strengthens VTI's position in the dynamic Korean automotive market and also leads the way to further expansion and new applications.

<http://www.vti.fi>

EV Group to supply to NIL Fab

EV Group, which has the world's largest installed base of nanoimprint lithography (NIL) equipment, announced the sale of an EVG570 High Volume Hot Embossing System to NIL Fab. NIL Fab. is the world's first NIL contract manufacturer that opens a new world of prototyping roadmap com-

pliant, low cost analytical devices and other consumer related products. NIL Fab's Phase 1 facility will offer prototyping services and low volume production for biosensors, Lab-on-a-chip, optics and photonics, magnetic storage, OLEDs and other applications that make use of low cost NIL processes and materials.

<http://www.evgroup.com>



The Materials Market Research File

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The Materials Market Research File (MMRF) is a comprehensive database allowing professionals to find and compare market research in various areas of the engineering and base materials world. The MMRF is updated continuously and provides information on market intelligence such as industry reports, conference proceedings, directories, newsletters etc., plus access to the Editorial Calendar and Current Issue of the leading English language Trade Magazines. The file is highly up-to-date, covering a period of 12 months only backdating from the current month.

www.materialmarkets.com



Business News

Micralyne expands employee base

Micralyne Inc., a developer and OEM manufacturer of MEMS (Micro-Electro-Mechanical-Systems)-based components, announced it has added over 20 new staff members in the last four months. This rapid pace of hiring is expected to continue as the manufacturing group seeks additional operators and technicians to fulfill current demand. The substantial growth in staff is primarily attributed to Micralyne's customers in the communications field who are experiencing a significant upsurge in volumes. In addition to current orders, forecasts are indicating future increases on a continual basis. This has resulted in Micralyne adding an additional shift of operation to its Edmonton micro-fabrication facility.

<http://www.micralyne.com>

MEMSCAP appointed its new CFO and finalized the sale of its Bernin site

MEMSCAP, provider of innovative solutions based on MEMS technology, announced the appointment of its new chief financial officer, Mr Yann Cousinet. Directly reporting to the Chief Executive Officer, Mr. Cousinet has officially joined the Company on October 1st, 2005. Later in October, MEMSCAP announced the completion of the sale of its Bernin site office building with signature of the official sale of property act, as well the finalisation of a major

Sensorion to acquire Alphasem equipment

Alphasem AG delivered one of its new die bonder Easyline 8088 to the Swiss start-up Sensorion AG. Easyline 8088 was especially developed for sensor assembly. Founded in 1998, Sensorion has developed a technique to manufacture sensors using standard CMOS technology, making them economical to produce. Its chips are found in systems that measure heat, moisture, gas flow and liquid currents in a wide range of industrial applications, where accuracy is critical. The equipment of Alphasem Easyline 8088 features high-speed air bearing pick and place system, closed-loop linear motor pick tool for bond line thickness control and the fully automatic wafer handling system.

<http://www.alphasem.com>

agreement with its financial and banking partners. The Company had announced on September 5 2005, the conclusion of a sale deal on this office building which finalisation occurred on October 17 2005. This partial sale of the Bernin site is made for a global amount of 8.16 million euros and a net amount, after deduction of the registry expenses, and other applicable fees or taxes, of 6.8 million euros corresponding to the net book value of this asset. The industrial buildings of the Bernin site (including clean-rooms) are not part of the sale as they will partly be proposed for rental.

<http://www.memscap.com>

WORLD MEMS INERTIAL SENSOR MARKET 2005

WISM 2005

Price: 2,900 Euros/3,500 US\$

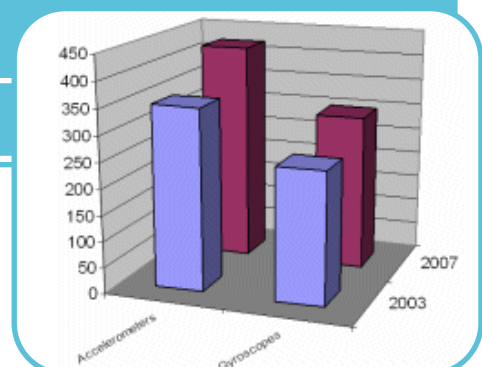
Publication Date: May 2005

Yole Développement is editing a new report describing the MEMS-based inertial sensor markets and applications. This is a major update of the 2004 version. This report provides a complete analysis of the micromachined acceleration sensors and gyroscopes applications and markets. It is providing an update of the applications, markets and market shares of companies involved in:

- Automotive (airbag, GPS, roll over...)
- Consumer (mobile phones...)
- Defense, medical and instrumentation (crash tests...)

This report is also providing a clear analysis of the technological trends. Compared to 2004, major changes have happened on the market. It also includes company profiles of the main inertial MEMS manufacturers.

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Business News

Microbridge Technologies announces its Sales Team

Microbridge Technologies Corp., a privately held technology company, announces the appointment of three sales professionals to respond to the variety of customers and opportunities that have already emerged for Rejutor™ technology. The Microbridge Rejutor is the world's first electronically programmable resistor for sensor and electronics companies dissatisfied with existing adjustment and temperature conditioning alternatives. The Rejutor is an integrated, analog micro-device that features eTC (electronic temperature compensation) in addition to programmable resistance. Today companies are working with the Rejutor technology for electronic calibration and conditioning, eliminating the workarounds of

alternatives such as digital and analog potentiometers, laser trimming and digital conditioning. The announcement of the Sales Team, with over 50 years of combined experience, coincides with the availability of Rejutor standard products. The Sales Team joins Nick Tasker, VP Business Development, who has been with Microbridge Technologies for two years introducing the Rejutor technology to the sensor, integrated circuit and electronic industries.

www.microbridgetech.com
www.rejutors.com

Apogee Technology focus on MEMS and Nanotechnology activities

Apogee Technology, a global provider of audio integrated circuits and an emerging Micro-Electromechanical Systems ("MEMS") device supplier,

reported that it has sold the assets of its audio division, including its Direct Digital Amplifier (DDX®) technology to SigmaTel, a global leader in analog intensive, mixed-signal integrated circuits for the digital multimedia consumer electronics and computing markets. The company will focus resources on MEMS/Nanotechnology activity. The Company is performing research to develop new sensor technologies in cooperation with The Research Foundation of State University of New York at Stony Brook and New York based Center for Advanced Sensor Technology. The goal of this research is to combine nano-composite materials and silicon-based microfabrication processes to enable a new generation of ultra-sensitive micro-sized sensors for gas and biological monitoring. The Company is also working to develop MEMS based medical devices.

<http://www.apogeemems.com>

▶ MIS 05: Status of the MEMS Industry 2005 Edition

Evolution of the MEMS business: will the foundries and contract manufacturers find the path to profitability?

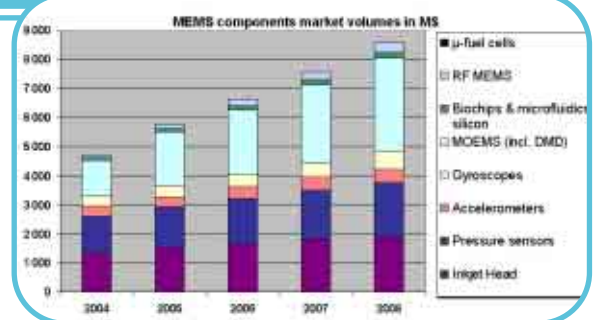
Yole Développement has edited the full updated version of the report "Status of the MEMS industry" describing the current structure of the MEMS industry, its possible evolutions, strategy, business models... The report contents unique features of the MEMS industry:

- Detailed analysis of MEMS markets
- Analysis of the last M&A and what could happen in the next 18 months
- Up to date analysis of the top 30 MEMS manufacturers worldwide
- Identification and analysis of emerging applications, including consumer, mobile phones, energy...
- Overview and analysis of the evolution of the foundries and contract manufacturers business

This report provides a complete analysis of the MEMS applications and markets as well as an in-depth analysis of the new applications under development. For each of applications under analysis, a synthesis in 2 pages is providing the details on who is doing what, market volumes, business trends and market shares (if available).

The report is also comparing the 2003 and 2004 situation of the top 30 MEMS manufacturers worldwide and providing extensive explanation on what has happened and the reasons of the foreseen evolutions.

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Business News

VTI selected by Korean car manufacturers

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SCA610 and SCA620 series single-axis accelerometers have already started and first cars are rolling out from the assembly lines. VTI supplies low-g accelerometer for four-wheel-drive ABS systems in Korea. This new business for the new application strengthens VTI's position in the dynamic Korean automotive market and also leads the way to further expansion and new applications.

<http://www.vti.fi>

Alliances & Mergers

Coventor and MEMS Exchange partners on MEMS tools

Coventor and MEMS Exchange have announced the formation of a strategic alliance to help researchers and companies identify and develop MEMS and nano-technology based products.

This partnership improves the interaction of the

MEMS Exchange design with the foundry services organization. MEMS Exchange now has access to Coventor's suite of MEMS software products, which can simplify the design, communication and content exchange for all of its customers. Coventor will issue trial licenses of its MEMulator, Etch3D and DESIGNER software tools to qualified MEMS Exchange customers upon request.

<http://www.coventor.com>

<http://www.mems-exchange.org>

You can send us press releases to mouly@yole.fr

EuropRACTICE start up support 2005 VC forum Invitation



25 November 2005, Institute of Physics, London

Are you looking for an investment opportunity in a MEMS start-up?

You are invited to the EuropRACTICE VC Start-up Funding Forum where you will have the opportunity to assess the 10 winning projects of the competition to find the most promising MNT (Micro & Nanotechnology) start-ups in Europe. During the VC Forum, project leaders will present their companies in 15 minute presentation in the morning and then, you will meet the different leaders in face-to-face meetings in the afternoon.

The selected projects include:

- A new cells based tool for the pharmaceutical industry in the development of novel biological products
- A revolutionary packaging technology for micro-components with a simpler manufacturing process to save money and increase yields
- A non-invasive blood glucose meter for people with diabetes
- Development of WiMax receiver – SPA (Signal Processor Array)
- Development & production of templates based on energetic ion track technology
- Hybrid microsystem framework for complete in

vitro detection and quantification of disease markers with specific products for Glucose Testing and Diabetes Management

- Low cost nanowire sensors to detect biological and chemical species at molecule level
- Innovative chemical sensors (oxygen, biofilm) for environmental and industrial applications
- Design and manufacturing of microequipment for the incorporation of nano material into polymers and the moulding of compounds into medical devices
- A miniaturised liquid delivery system dispensing small amounts of liquid in an atomised spray, controlled by a microchip and activated by a remote sensor.

How to Register ?

Venture capitalists should confirm their attendance by completing the registration form available on www.europRACTICE.com (or ask to verollet@yole.fr)

Institute of Physics, 76 Portland Place, London W1B 1NT, England

For additional information, please contact: Romain VEROLLET, Phone: +33 4 72 83 01 93, verollet@yole.fr

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November 2005 - n° 41

11

Multi-Customer Actions

Description of Multi-Customer Actions From Yole Développement

- Participation: bring together 5 to 7 companies interested to analyze a topic (SiC, GaN, SOI...)
- Advantage: share the cost between the different companies (budget per company 25 kEuro)
- Objectives: make a complete and in-depth description of this area and provide specific answers to the participants of this action:
 - General & global analysis common to each partner (in-depth description & analysis of these areas with quantitative evaluation of the market)
 - Custom work of qualitative analysis (specific questions define by each partner)
- Duration: 6 months

Multi-Customer Actions detailed objectives

1. General objectives, common to each company:
 - Analyze the industrial food chain of this fields : material suppliers, service providers, components manufacturers, capital equipment manufacturers...
 - Describe the device markets using the studied technology, per application
 - Analyze and describe the technologies for the manufacturing of components using the studied technology (bottlenecks, achievements, process steps, roadmaps...)
 - Description of most significant companies and major research labs involved in this field world wide
2. Specific work for each company:
 - Describe the equipment and material markets for the period 2005-2010 for specific equipment
 - Answer specific marketing and commercial questions.

Added value of Yole Développement

- Unique expertise of the market, the technology and the industry (from equipment manufacturers up to device manufacturers)
- Strong worldwide network of contacts in companies possible users of the technology (many of them are our customers)
- Solid methodology able to provide valuable market data using scenario analysis.



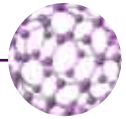
On-going Multi-customer analysis

1. World MEMS equipment markets 2005
2. Thick SOI : status of the markets and new developments
3. SiC : from devices to equipment and material markets
4. GaN : from devices to equipment and material markets
5. New technologies for power devices
6. 3rd generation photovoltaic solar cells
7. Advanced packaging
8. Microreaction technologies
9. Nano imprint lithography

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Cell: +33 686 681 931, Email: eloy@yole.fr



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Events

Nanoroadmap Conference in France

Lyon, France, November 23rd 2005



About the Conferences

Nanoroadmap (NRM – www.nanoroadmap.it), a project co-funded by the European Commission (FP6), has for objective to provide coherent scenarios and technology roadmaps up to the year 2015 for the application of nanotechnology in three selected fields (material, health and medical systems, energy). To disseminate the results, several conferences are organised throughout Europe:

- October 26th – Prague. Organising partner: Technology Centre
- November 8-10th – Cologne (in conjunction with the International Conference). Organising partner: VDI/VDE-IT
- November 10th – Padua. Organising partner: AIRI/Nanotec IT
- November 15th – Helsinki. Organising partner: VTT
- November 18th – Barcelona. Organising partner: W&W
- November 21st – London. Organising partner: IoN
- November 23rd – Lyon. Organising partner: Yole Développement
- November 28th – Tel Aviv. Organising partner: MATIMOP

Yole Développement organizes the French conference. The program is presented below. The official language of this conference is French.

The conference admission fees are fixed at 60 €, VAT excluded. The fees include coffee breaks and lunch. To subscribe, you can download the subscription form at: <http://www.yole.fr/nanoroadmap.pdf>

Contact:

Yole Développement

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45 rue Sainte Geneviève - F-69006 Lyon, France



Programme

8h30	Welcoming
9h00	Opening keynote address
9h15	Roadmap "Materials", established by W&W, Laslo Bax, W&W
9h40	<ul style="list-style-type: none"> • Ceramic Nanomaterials: an industrial reality, Pierre-Paul Jobert, DGTEC
10h05	<ul style="list-style-type: none"> • Influence of particles size on thermal properties of aluminium powders Benoît Rufino, SNPE Matériaux Energétiques
10h30	Coffee break
11h00	<ul style="list-style-type: none"> • Recent developments in the field of carbon nanotubes Kai Schierholz, Nanoledge
11h25	<ul style="list-style-type: none"> • Carbon nanotubes for hybrid nanostructured materials. Daniel Bernard, Arkema
11h50	<ul style="list-style-type: none"> • The network of excellence Nanofun-Poly: a unique frame of research on nanomaterials Jean-François Gérard, Laboratoire des Matériaux Macromoléculaires, INSA
12h15	Déjeuner
14h00	Roadmap "Energy", established par IoN et VTT Otilia Saxl, IoN
14h30	<ul style="list-style-type: none"> • Evolution of micro-sources energy and relation with nanomaterials Jean-Pierre Joly, CEA-Liten
14h55	Equipment: Lithography by Nanoimprint (NIL) Gilbert Lecarpentier, Gaël Schmidt, Suss MicroTec
15h20	Coffee break
15h50	Roadmap "Health & Medical Systems", established by VDI/VDE Clémence Labat, Yole Développement
16h20	<ul style="list-style-type: none"> • Nanofluidic technologies for high quality biochips Moussa Hoummady, Nanobiogène
16h45	<ul style="list-style-type: none"> • Intelligent Sensors, Fabrics and Habitats in Healthcare (CAVEHIS): which place for micro& nanotechnologies? André Dittmar, Laboratoire Microcapteurs et Microsystèmes Biomédicaux, INSA



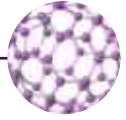
Journée des
NANOSCIENCES-
NANOTECHNOLOGIES
en Rhône-Alpes



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November 2005 - n° 41

13



Life & Death

Application of zinc oxide nanorods

The University of Manchester is involved in the research and development of zinc oxide (ZnO) nanorods for application within third generation photovoltaic cells. The research is of a multi disciplinary nature being undertaken jointly by the university's Schools of Physics and Astronomy, Chemistry and Materials Science. Research and development activities within this field have also led to the establishment of a start up company (Nanoco) that manufactures quantum dots that can be used as photo-sensitisers for PV cells. Much of the present research effort to improve PV design efficiency and reduce fabrication costs is focused on extremely-thin-absorber (ETA) cell design. To date, the leading ETA cell designs have been based on dye coated nanoporous titanium dioxide (TiO₂). It is intended that this project will undertake the work programme leading to the development of a laboratory scale, pre-commercial prototy-

pe. Partners are sought for involvement in the construction / manufacture of a PV test module and with the testing of the module within suitable solar simulators.

www.manchester.ac.uk

Germany: opening of a Research School for Nanostructures

The International Max Planck Research School for Science and Technology of Nanostructures has been inaugurated in Halle/Saale (Germany). The school will give German and foreign students the opportunity to prepare themselves to receive a doctorate in the field of nanostructured materials. The Max Planck Institute of Microstructure Physics in Halle, the department of physics at Martin Luther University in Halle-Wittenberg, and the Fraunhofer Institute for Mechanics of Materials in Halle together developed this research and education pro-

gramme. The 15 doctoral students, whose education will begin in the next winter semester, were chosen in a multi-step process from applicants from five continents. They have degrees in physics, chemistry, materials science and engineering.

www.nano-imprs.mpg.de

Nanofabrication facility of Veneto region inaugurated

Veneto Nanotech Nanofab, the Nanofabrication Facility of Veneto Region, was officially inaugurated at Vega, the Venice Science and Technology Park (Italy). Financed by European, National and Regional Government with more than 20 M and founded both by Vega and Venetian Universities, Nanofab will promote interaction between the nanotechnology and business communities, research institutions, public and private investors.

www.venetonanotech.it

Alliances & Mergers

Molecular Imprints completes \$17M financing of a planned \$25 Million Series C financing

Molecular Imprints, Inc. (MII) raised \$17 million in the first closing of a planned \$25 million Series C financing. Molecular Imprints will use the money to expand its Imprio[®] product line to satisfy growing customer demand. To date, MII has raised over \$60M in funding. Investors participating in this financing include Dai Nippon Printing Company (DNP), Alloy Ventures, Motorola Ventures, Harris & Harris, Draper Fisher Jurvetson, Hakuto Co. Ltd., Asset Management Partners and others.

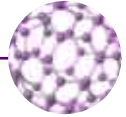
www.molecularimprints.com

US start-up Nanosys and Sharp, Japan collaborate on display

US start-up Nanosys has entered a multi-year development agreement with Sharp, Japan. The companies will work on nanotechnology-based display technologies. The pair are already collaborating on fuel-cell technology for portable electronics.

www.nanosysinc.com

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Techno News

Researchers break a record in magnetic storage

In a paper published online on Physical Review Letters and entitled "Uniform Magnetic Properties for an Ultrahigh-Density Lattice of Noninteracting Co Nanostructures", a team of French (Paris7-CNRS, LURE, IPCMS, ESRF) and Swiss (EPFL) researchers report what they believe to be the ultimate density limit of magnetic recording. They worked on the magnetic properties of two-dimensional Co nanoparticles arranged in macroscopically phase-coherent superlattices created by self-assembly of two-atoms-high islands of cobalt on a single-crystal gold substrate. Particles show a

density of 26 trillion islands per square inch (the highest recorded, and about 200 times the bit density of hard disks), are monodomain, and have uniaxial out-of-plane anisotropy. The distribution of the magnetic anisotropy energies has a half width at half maximum of 17%, a factor of 2 more narrow than the best results reported for superlattices of three-dimensional nanoparticles, underlined the team. Above all, data show the absence of magnetic interactions between the particles. However, this is not yet a ready to use media storage solution: one particular condition of the experiment was a temperature of -223° C. Researchers are now working to solve this problem.

www.cnrs.fr
www.epfl.ch

Nanohelix to be used to build novel resonators, inductors and piezoelectric devices for use in sensors

A previously-unknown zinc oxide (ZnO₂) nanostructure that resembles the helical configuration of DNA has been developed by a research team headed by Professor Zhong Lin WANG. Professor WANG is concurrently working for the Georgia Institute of Technology, Beijing University and the National Center for Nanoscience and Technology of China (NCNST) at the Chinese Academy of Sciences (CAS). Zinc oxide is known as an important semi-conductive and piezoelectric material with many applications in opto-electronics, telemetric sensors and bio-functions. Until now, its only nano-forms have been nanobelts, nanosprings and nanorings. For the time being the researchers are focused on building novel resonators, inductors and piezoelectric devices based on the nanohelix for use in sensors. After that, they plan to make multifunctional devices by integrating nanohelix devices with those made from other materials.

www.nanocctr.cn

Carbon nanotubes for hydrogen storage

The Istituto di Struttura della Materia (ISM) at Italian National Research Council (INRC) has patented a method to fill the cavity of carbon nanotubes by a wet chemical procedure, ensuring the absence of any external material. This method allows an ordered filling of the hollow structure, to choose which part of the hollow structure to fill up and to choose all the synthesis parameters, using a low-cost procedure. Nanoparticles of metallic catalysts can be deposited uniformly inside carbon nanotubes to improve their hydrogen storage capacity. The aim of the project increases the possibility of using the internal active sites of the tubes, using a catalyst with very small dimensions and separated in fine particles that change slightly the weight of the material. ISM is currently looking for several partners, including a company skilled in preparing carbon nanotubes.

www.ism.cnr.it

Business News

Nanologue: Results of mapping phase on line

Nanologue, the EU-funded project, put online the Nanologue Mapping Study and the Nanologue Background Paper. Designed to prepare the ground for subsequent discussion, this first project phase aims at providing an overview of current research and positions on ethical, legal and social aspects (ELSA) of selected nanotechnologies. The Mapping Study identified more than 100 nanotechnology related publications, out of which 15 have been analysed in more detail. It offers summaries of these studies as well as the identification of relevant ethical, legal and social aspects. Three application areas, namely energy conversion and storage, food packaging and medical diagnosis, have been selected as subjects for further investigation and dialogue. The Nanologue Background Paper looks in depth at the current positions on both benefits and risks from the perspective of seven distinct ethical, legal and social aspects.

www.nanologue.net

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Business News

Kotura, Inc. transfers packaging assembly to Asia

Kotura, Inc., the leading provider of silicon photonic components, today announced that it has moved its packaging assembly to Asia through a contract manufacturing agreement with Broadex Technologies.

<http://www.kotura.com>

<http://www.broadex-tech.com>

CyOptics backed by new financier

InP optical component manufacturer CyOptics has completed its latest funding round with \$3 million from Birchmere Ventures. CyOptics acquired its InP manufacturing business from TriQuint Semiconductor earlier this year.

<http://www.cyoptics.com>

Dow Corning commits to optoelectronics

Dow Corning Corp. said that it was expanding its focus on the optoelectronics market. It announced that its Photonics Solutions business development program will become part of the company's mainstream electronics business.

<http://www.dowcorning.com/electronics>

Thomson withdraws from TV

Thomson has sold its CRT activities including tube plants in China, Mexico and Poland to India's Videocon and its French tube glass plant to Spain's Rioglass, thus definitely withdrawing from TV components.

OLED market growth

The first quarter 2005 OLED market grew 19% to \$102M, according to DisplaySearch, with Samsung the industry leader at \$28.1M, +24%, followed by RiTdisplay with \$19.2M, +4%, the leader in unit sales.

<http://www.displaysearch.com/>

Kotura appoints Bookham founder Dr. Andrew Rickman to board of directors

Kotura, Inc., the leading provider of silicon photonic products, today announced that Dr. Andrew Rickman, OBE, founder of Bookham, Inc. (Nasdaq: BKHM), has joined the company's distinguished Board of Directors.

<http://www.bookham.com>

U.S. Energy Bill provides funding for solid-state lighting

The U.S. government has finally passed the Energy Policy Act of 2005, which will provide significant levels of funding for the development of white LED lighting technology. The Act authorizes the formation of the Next Generation Lighting Initiative (NGLI), a public-private partnership which could provide up to \$50 million annually to develop solid-state lighting.

Hella earns auto prize for LED headlamp concept in Barcelona

A prototype LED headlamp developed by Hella and VW has been awarded a top innovation prize at the Barcelona Motor Show. Hella expects to begin production of the new LED headlamp in 2008. The prototype achieves a luminous flux of around 1,000 lumen in low beam, creating light similar in intensity to xenon headlamps. The award-winning design was developed in cooperation with Volkswagen for the Golf 5. It incorporates low beam, high beam, indicator and daytime running lights all implemented using LED technology.

<http://www.hella.com/>

Two US fiber component makers top up venture funding

VCSEL manufacturer Picolight and integrated InP component maker Alphion have both closed venture financing rounds with additional funds. Picolight, a Louisville, CO, company specializing in 1310 nm VCSELs, has added \$14.5 million through a combination of equity investment and debt finance. Also looking to scale-up production is Alphion of Princeton, NJ, a component vendor specializing in InP integration. It has secured an extra \$1.5 million, bringing its third-round equity investment to \$12.1 million and total funding so far to \$44.1 million.

<http://www.alphion.com/indexfla.html>

<http://www.picolight.com/Default.asp>



Business News

Sensors Unlimited wins \$4.5 million contract

InGaAs camera manufacturer Sensors Unlimited Inc. (SUI) has won a \$4.5 million contract from the Defense Advanced Research Projects Agency (DARPA) Microsystems Technology Office (MTO) to develop a 1280 x 1024 focal plane array (FPA). The FPA will form the basis of an uncooled dual wavelength camera that is sensitive between 0.4 μm - 1.7 μm and capable of night vision imaging. SUI claims that the development of the FPA will deliver a breakthrough in the performance of this form of detector. The FPA will enable DARPA to fulfil its goal of identifying a human target at 100m under no-moon conditions.

<http://www.sensorsinc.com/>

Samsung Electro-Mechanics targets LED lighting market

Samsung Electro-Mechanics (SEM), part of the giant Korean electronics manufacturer Samsung, plans to begin manufacturing LED lighting products and LED backlighting units (BLUs) for large LCD televisions. Until now, SEM has manufactured a range of SMD LEDs and LED lamps for several applications, principally mobile phone handsets. In March 2004, SEM signed an agreement to license white LED phosphor technology from Osram. SEM has carried out joint development work with an LCD television maker, with the aim of launching LED BLU products in the first half of 2006.

<http://www.sem.samsung.com/en/indexMain.jsp>

Life & Death

Highwave on liquidation

Highwave, the French provider of customized subsystems for Ultra Long Haul, Long Haul and Metrocore optical networks, went into liquidation in October 2005. Created in 1998, the company had initially 1 000 employees and decreased its staff to 50 following the Telecom bubble burst in 2001.

<http://www.highwave-tech.com/>

Techno News

Blu-ray hits back as Panasonic launches PC drives

Matsushita Electric is to mass-produce Blu-ray Disc drives based on GaN lasers for both notebook and desktop PCs early next year through its Panasonic electronics brand. Sample shipments of the recordable drives, which are the first of their kind to be released, will begin this month. Volume production of drives for use in desktop PCs will follow in January 2006, while the slimmer notebook version of the technology is expected to follow suit in March. The

announcement comes just days after Matsushita's rival Toshiba launched its HD DVD drive for notebook PCs.

<http://www.panasonic.co.jp/global/>

AIST develops equipment to do flexible micro-fabrication on silica glass

Japan's National Institute of Advanced Industrial Science and Technology (AIST), an independent administrative institution, has developed two new manufacturing processes for flexible micro-fabrication of silica glass based on its proprietary laser-induced backsi-

de wet etching (LIBWE) technology. AIST's LIBWE technology is a one-step method for micro-fabrication of silica glass plate by using a nanosecond-pulsed ultraviolet (UV) laser.

http://www.aist.go.jp/index_en.html

Monolithic wavelength converter runs at 40G

Lucent's Bell Labs in the US has fabricated a compact wavelength-conversion module that operates at 40 Gbit/s. The monolithic device integrates a converter and an eight-channel multifrequency laser (MFL) onto an indium-phosphide chip measuring 4 x 6.5 mm.

<http://www.lucnet.com/>

In-waveguide gratings holographic stepper foundry services by Ibsen Photonics

With a background in fused silica transmission gratings, Ibsen Photonics has established a production line for grating patterning on wafers. The patterning is done using proprietary technology called Holographic Stepper technology, and offers cost-effective grating patterning with wafer-based scalability and holographic performance.

<http://www.ibsenphotonics.com/>

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November 2005 - n° 41



Alliances & Mergers

Philips buys out Lumileds as Agilent cashes chips

Lighting pioneer Royal Philips Electronics is to buy Agilent Technologies' 47% share in the LED manufacturer Lumileds for 765 million (\$948 million) in cash. The deal, which will mean that Philips owns 96.5% of Lumileds, is part of Agilent's wider plan to sell off its entire semicon-

ductor business unit, which also includes GaAs IC, fiber-optic component and low-brightness LED manufacturing facilities. Private equity firms Kohlberg Kravis Roberts and Silver Lake Partners are expected to take control of the remaining semiconductor business in a deal worth about \$2.6 billion in total, according to reports in the Wall Street Journal online.

<http://www.lumileds.com/>

JDS to acquire Agility Communications Inc.

JDS Uniphase announced today a definitive agreement to acquire Agility Communications, Inc., a leading provider of widely tunable laser solutions for the optical network. The acquisition establishes JDS Uniphase's leadership in the rapidly growing market for tunable lasers and transponders, and positions the company as the broadest end-to-end agile optical network portfolio provider in the marketplace today. Agility Communications is privately held with approximately 90 employees and headquarters in Santa Barbara, California. The acquisition is subject to customary closing conditions and regulatory approvals, and is expect-

ted to close in the quarter ending December 2005. The terms of the acquisition were not disclosed.

<http://www.jdsu.com>

Taiwanese LED makers Epistar and UEC to merge

Two Taiwanese LED manufacturers, Epistar and United Epitaxy Company (UEC) are to merge, according to filings with the Taiwan Stock Exchange (TSE), as reported by the DigiTimes website. The new company, Epistar, will be considerably larger than its rivals in the Taiwan LED industry in terms of operation and production scale, as Epistar is a leader in the high-luminance blue LED segment with its patented ITO (indium-tin oxide) technology and UEC

remains Taiwan's largest supplier of red-orange-yellow AlGaInP LEDs. The merger will take effect on December 30, 2005 in which 2.24 shares of UEC will be swapped for one Epistar share.

<http://www.epistar.com.tw/>

Marconi expands Vodafone Italy's optical network

Vodafone Italy, the Italian mobile operator controlled by the Vodafone Group, has employed Marconi's Multihaul 3000 photonic technology to connect the island of Sardinia to its Italian national network. The links were customized for submarine installations and will connect Sardinia's transport network to the rest of Italy.

<http://www.vodafone.com/>

<http://www.marconi.com/>

Danish start-up grabs Infineon's dilute nitrides

Alight Technologies, a university spin-out company based in Copenhagen, Denmark, has agreed to take over the dilute nitride VCSEL technology platform belonging to Infineon Technologies. The German chip manufacturer sold off much of its fiber-optic business to Finisar earlier this year in what turned out to be a protracted transaction, although that deal did not include its GaInNAs technology. According to a statement from Alight, the Danish firm will acquire manufacturing equipment, intellectual property rights and 1300 nm wafers.

<http://www.alight.dk/index.htm>

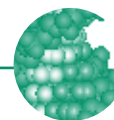
Nozomi selects Photline as European distributor

Nozomi Photonics, a supplier of high speed optical switches and Photline Technologies, a provider of modulation solutions for high data rate optical transmission networks, announced a distribution agreement under which Photline will distribute Nozomi's optical switches portfolio in Europe.

<http://www.nozomiphotonics.com/>

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Alliance & Mergers

Caliper completes acquisition of NovaScreen

Caliper Life Sciences (USA, Hopkinton, MA) has announced the closing of its previously announced planned acquisition of NovaScreen BioSciences Corporation (USA, Hanover, Maryland). The acquisition combines NovaScreen's screening, profiling and assay development services with Caliper's LabChip® and advanced liquid handling products to provide the pharmaceutical and biotechnology industry with a central resource for drug discovery solutions.

www.caliperls.com

www.novascreen.com

Qiagen quickens acquisition pace: purchases of Nextal, SuNyx and LumiCyte broaden pre-analytical sample prep lines

Qiagen N.V. (The Netherlands, Venlo) continued its recent acquisition spree, in June and earlier this month, with the acquisition of three companies whose products filled holes in the company's pre-analytical sample preparation line. The late June purchase of Montreal-based Nextal Biotechnologies provides a foothold in the protein crystallography market, while the combination of recent acquisitions of SuNyx GmbH and LumiCyte Inc. address sample prep in the MALDI market.

Business News

Oxford Gene Technology grants microarray licence to the Norwegian Microarray Consortium

Oxford Gene Technology (United Kingdom, Oxford) granted a microarray licence to the Norwegian Microarray Consortium (NMC). The NMC provides spotted DNA microarray technology and related services to the scientific community in Norway. This licence allows the NMC to extend its microarray sales into European territories covered by the OGT Southern array patents.

<http://nova2.idi.ntnu.no/nmc/>

www.ogt.co.uk

Affymetrix dominates DNA microarray market

A recent survey reveals that Affymetrix (USA, Santa Clara, CA) continues to be the dominant supplier in the DNA microarray market, which includes DNA microarrays, microarray scanners, and data analysis software. The survey found that 81% of researchers use commercial DNA microarrays, either exclusively or in addition to arrays printed in the lab or in a core facility. Among these commercial array users, 75% of scientists use Affymetrix arrays. However other suppliers -- such as Agilent Technologies and Applied Biosystems --

are making inroads into this growing market, particularly in the areas of microarray scanners and data analysis software.

Affymetrix has also announced that GlaxoSmithKline (UK, London) has selected the Affymetrix GeneChip® Human Mapping 500K Array Set to find the genetic variations associated with diseases. Under the agreement, GSK will use the arrays to perform whole-genome association studies across tens of thousands of samples. The Affymetrix GeneChip 500K is designed to enable researchers to examine the entire genome in more detail.

www.affymetrix.com

www.gsk.com

Agilent technologies and Picometrics to co-market capillary electrophoresis/laser induced fluorescence solutions

Agilent Technologies (USA, Palo Alto, CA) and Picometrics S.A (France, Ramonville) announced a nonexclusive co-marketing agreement for Picometrics' Laser Induced Fluorescence (LIF) detection systems combined with Agilent's Capillary Electrophoresis (CE) system.

www.agilent.com

www.picometrics.com

Greiner Bio-One and Scienion announce a novel solution for protein microarrays

The cooperation partners Greiner Bio-One GmbH (Germany, Frickenhausen) and Scienion AG (Germany, Berlin) have launched a new, integrated solution for protein microarrays, which comprises a protocol and buffer system specially designed for use with Greiner's HTA Slides.

www.gbo.com

www.scienion.de

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Business News

Exonhit launches splicearray using agilent technologies' microarray platform and collaborate on the development of blood diagnostics for the early detection of cancers with bioMerieux

ExonHit Therapeutics (France, Paris) and Agilent Technologies (USA, Palo Alto, CA) announced the launch of ExonHit's SpliceArray Service, which uses a new generation of microarrays developed with Agilent to detect alternative splicing in potential drug targets. In support of its launch of SpliceArray Service, ExonHit has become an Agilent Certified Service Provider. ExonHit and BioMérieux (France, Marcy l'Etoile) announced that they signed an agreement to extend their collaboration for six years for the discovery and development of new blood diagnostics in the area of early cancer detection. These diagnostic tests are completely novel because they should enable the detection of cancer from a simple blood sample and

at a very early stage, before clinical symptoms appear. The early detection of cancer is crucial in increasing the chance of successful therapy.

www.biomerieux.com
www.agilent.com
www.exonhit.com

Collaboration to undertake one of the largest whole-genome association programs ever conducted to search for genes associated with complex diseases

Illumina (USA, San Diego, CA) has announced that it is collaborating with the Wellcome Trust Sanger Institute (WTSI) and the Wellcome Trust Case-Control Consortium (WT-CCC) on the design of a custom Sentrix® BeadChip that will enable researchers to study the impact of those SNPs that cause amino acid changes (non-synonymous), on a broad and deep range of disease samples.

WT-CCC has also partnership with Perlegen and Affymetrix to Search for Genetic Origins of Ten Complex Diseases.

Perlegen Sciences will genotype 15,000 individuals and produce more than 10 billion individual genotypes using Affymetrix GeneChip® technology, including the new Human Mapping 500K Array Set.

www.illumina.com
www.sanger.ac.uk
www.wellcome.ac.uk
www.perlegen.com

PerkinElmer and Eppendorf announced co marketing agreement

PerkinElmer (USA, Boston), a global leader in health sciences, and Eppendorf AG (Germany, Hamburg), a leading supplier of systems and research tools for the biotechnology industry worldwide, announced the signing of a co-marketing agreement to jointly promote microarray technology involving Eppendorf's DualChip™ content arrays with PerkinElmer's ScanArray™GX Microarray Analysis System. The combination of the novel DualChip technology consisting of 2 identical arrays on a single slide and the user-friendly scanning protocols of ScanArray™GX provides a complete solution from array processing to data analysis.

Techno News

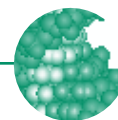
Microfluidic flow sensor elements developed by Sensirion AG

3rd generation MEMS based liquid flow sensors for microfluidic systems have been announced by Sensirion AG (Switzerland, Staefa ZH). The new, low priced components are designed for integration into analytical instruments, medical devices and life science applications. The high integration level on-chip leads to a reduction of cost, size and weight. The integration of the sensor element with digital intelligence (for linearization and temperature compensation) on the same micro chip is the key ele-

ment of these 3rd generation MEMS sensors. The components allow detection of media and accurate measurements of very low liquid flow rates down to nano liters per minute with very short response times and stunning repeatability. The liquid media are totally isolated by walls of PEEK or fused silica (glass) as the semiconductor sensor chip is mounted completely outside of the flow path and senses through the wall of the tubing. The largest model is designed for flow rates up to 3 ml/min. Response times in the millisecond range help to monitor and control dynamic effects in microfluidic systems.

www.sensirion.com

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Techno News

Canon's Inkjet printer technology will slash price of DNA chips

Printer company Canon (Japan, Tokyo) has unveiled a technique based on its inkjet technology that will allow for cheap mass production of DNA chips. DNA chips are used to trace diseases and, according to a report on Nihon Keizai Shimbun, the tech-

nology, likely to be ready in two years' time, will cut the price of production by 90 per cent. The technology uses a solution of DNA rather than ink and sprays that onto glass in a precise way. Canon has already demonstrated a prototype that produced some hundreds of DNA chips, which currently are being made using expensive semiconductor tech. Prices of these current chips are around one million yen (approx. 7000).

www.canon.com

Innovative Micro Technology (IMT) announces new results for MEMS Rare Cell Purifiers

Innovative Micro Technology (USA, Santa Barbara, CA) announced that it has passed several key milestones and demonstrated integrated operation with its Rare Cell Purification System (RCPS), including sorting viable human cells at high speeds with greater than 95% purity. The RCPS is based on MEMS technology which, in its final configuration, will have parallel channels providing ample speed for clinical use. Using fluorescence detection to identify the proper cells, ultra-high-speed MEMS valves switch flow from waste to sort and vice versa in 15 microseconds. Anticipated applications include cancer treatment, nuclear and chemical warfare risk abatement, and disease control.

The RCPS is currently funded by the DARPA Defense Sciences Office as an integral part of the DARPA project to create an artificial human immune system on a chip. The high speed sorter will allow popula-

tion of the chip-scale system with very specific types of immune cells. The payoff will be a very rapid, chip-scale device to screen new vaccines against biological warfare agents and emerging pathogens.

www.imtmems.com

Taking high throughput sequencing to a new level with genome sequencer 20 System

Roche Applied Sciences (Germany, Penzberg) and 454 Life Sciences (USA, Branford, CT) introduce the Genome Sequencer 20 System, which enables one individual to sequence an entire genome, of any size, from a single sample preparation. The hallmark of this novel approach is its nanotechnology-based sequencing. It allows a single instrument to produce over 20 million nucleotide bases in a four hour run, a 100 fold increase over current macro-scale devices. Proprietary picoliter-technologies, patented light emitting sequencing chemistries, and state-of-the-art informatics are integrated by Roche to create the Genome Sequencer 20

System. Whole genomes can be sequenced in days, not months with this system.

www.roche-applied-science.com

www.454.com

Fused silica microfluidic chips by NSG Precision Cells

Microfluidic chips from NSG Precision Cells (USA, Farmingdale) offer industry leading features in the field of Microarrays. The chips are manufactured from a single fused silica substrate with a fluid path etched within. The fused silica substrate has significant optical, thermal, and anti-reactive advantages over materials used in most microfluidic chips. NSG Precision Cell's manufacturing technology sets accuracy standards, with etching path depth from 5µm. The incredibly smooth fluid path has a surface roughness of 0.1µm and complicated layouts are available by wet etching of the path. Applications for NSG's Microfluidic Chips include diagnosis & analysis, chemical & biochemical synthesis, chromatography & electrophoresis analysis, environmental simulation, and chemical degradation.

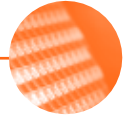
www.nsgpci.com

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November 2005 - n° 41

21



Business News

TriQuint excited about cell-phone prospects

Posting a third-quarter net profit of \$2.6 million on improving revenue, TriQuint expects to see business pick up strongly as its cell-phone power amplifiers gain more traction. GaAs chip manufacturer TriQuint Semiconductor posted revenue of \$75.2 million in the quarter that ended on September 30, representing a drop of 8% from the same period in 2004. Despite that drop, the Hillsboro, OR, firm registered a net profit of \$2.6 million as capacity utilization in its high-volume fabs improved and the disposal of its optoelectronics business benefited the bottom line. Reductions in the company's workforce led to a 7% sequential decrease in operating expenses, while demand in key sectors is looking healthier. CEO Ralph Quinsey attributed the improved performance to both increased shipments to CDMA handset makers and also a more buoyant military market than has been seen of late.

<http://www.triquint.com/>

Soitec reports record sales for its first half financial year

Soitec, manufacturer of silicon-on-insulator (SOI) wafers and other engineered substrates, announced record consolidated sales of 63.4 million Euros for the second quarter of its 2005-2006 financial year. As predicted, increasing adoption of SOI, especially 300mm, in servers, PCs and consumer electronics, drove rising sales. Half-year consolidated sales rose 72.6% on a year-on-year basis to 114.6 million Euros. The combination of volume growth, stable prices and manufacturing efficiencies all contribute to an anticipated return to net profit as early as the first half of the current financial year, despite the unfavourable exchange impact. The Group, having reported year-on-year sales growth for the first half of the year above its full year guidance, is confident that it will outperform a minimum of 60% over the full year.

<http://www.soitec.com>

Worldwide equipment industry Book-to-Bill of 1.03 in September

With worldwide bookings of \$4.6B and billings of \$4.5B, the equipment industry posted a B:B ratio of 1.03 in September, according to VLSI Research Inc.

This is no surprise since September is typically a strong month for the equipment industry, said the market research company.

High utilization rates, driven by the seasonal demand surge for chips, are stimulating the growth in equipment bookings. Wafer Fab utilization reached 96% in September, while Test and Assembly were at the 98% level.

<http://www.vlsiresearch.com>

	Worldwide Booking	Worldwide Billings	B:B ratio
August 2005 (Revised)	4.214	3.941	1.07
September 2005 (Preliminary)	4.611	4.489	1.03
October 2005 (Forecast)	4.539	4.135	1.10

Source : VLSI Research, October 2005

Life & Death

Alphasem expand operations in China

The chip-equipment provider Alphasem has relocated to a larger premises in Suzhou, China, to expand its efforts in Asia. The Swiss company, a supplier of die attach and die sort systems for the backend sector of semiconductor production, said the move will enable it to serve the China market "faster and more efficiently." Alphasem's Easyline series of machines will be produced in the new facility in Suzhou. The new facility is 1,500 square meters and begins with about 30 employees. In October, Alphasem books several orders from the Asian area. 18 Swissline systems were ordered by the Taiwan-based company Siliconware Precision Industries.

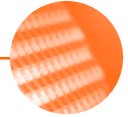
<http://www.alphasem.com>

STEAG HamaTech expands its sales team in the USA

STEAG HamaTech USA, Inc., a wholly owned subsidiary of the STEAG HamaTech parent company located in Sternenfels, Germany announced that Mr. Brian E. Lewis has joined the company's US sales team for the photo-mask business unit. "Lewis will spearhead product development, sales and marketing of STEAG HamaTech's latest generation mask process equipment platform in North America", said Uwe Dietze, President & CEO of STEAG HamaTech USA.

<http://www.steag-hamatech.com>

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Life & Death

AMD inaugurates its new 300-mm fab in Dresden

At a ceremony attended by top German government officials and leaders from across the semiconductor industry, AMD announced the grand opening of its 300 millimeter (mm) Fab 36 in Dresden, Germany.

With the production ramp in Fab 36 progressing on

schedule, the company intends to make 90nm production shipments in the first quarter of 2006 and begin 65nm production by the end of 2006. AMD has set a goal to be substantially converted to 65nm in Fab 36 by mid-2007. New facility will help AMD nearly double its output in the next three years, meet growing demand for AMD64 processors and achieve aggressive growth objectives.

<http://www.amd.com>

Techno News

Suss MicroTec introduces port mapping for SussCal®6

SUSS MicroTec AG has added a new feature called Port Mapping to SussCal 6. Released last June, SussCal 6 is calibration software that provides a fully automated multiport calibration procedure for RF & microwave wafer level test systems. In a multiport setup, the possible number of connections between the probes and the vector network analyzer (VNA) increases exponentially with the number of ports. SussCal 6 now solves this problem using a new feature called port mapping. The user simply selects the calibration method, and a powerful algorithm then calculates the possible configurations of connections to the VNA and the necessary thru standards to complete the calibration. The user can also change how the ports are mapped to the VNA or the type of the thru standards used by selecting those options from

SussCal's intuitive graphical user interface.

<http://www.suss.com>

Nitronex announces GaN WiMAX power transistors

Nitronex Corporation, a developer and manufacturer of high performance RF power transistors for the wireless infrastructure market, is pleased to announce the introduction of a family of RF power transistors, based on its unique SIGANTIC® (GaN on silicon) technology, for the WiMAX market. The products' ability to simultaneously deliver high frequency, high power and broad bandwidth provides better performance than alternative technologies to current and future WiMAX infrastructure designers. GaN's higher power density enables the design of packaged devices with higher input and output impedances (20 ohms), eliminating the need for output matching, and making the device very easy for power

amplifier developers to use, claimed the company. Pre-production sample orders begin shipment in Q4 2005.

<http://www.nitronex.com>

IMEC launched affiliation program to develop RF-CMOS for the 45-nm era

As part of IMEC's centralized research platform for sub-45nm CMOS technologies, the new IMEC industrial affiliation program (IIAP) on Analog/RF-CMOS for the 45nm era defines its goals to keep conquering the ITRS challenges. The program aims to develop process modules and device architectures to achieve RF CMOS performance at the 45nm node and to provide the necessary models for active and passive devices. The potential of the technology will be assessed through the benchmarking of circuit demonstrators.

<http://www.imec.be>

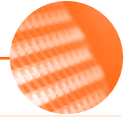
DARPA ends litho aid at critical juncture for maskless

DARPA (Defense Advanced Research Projects Agency) has announced it will stop its program on maskless lithography. Although, DARPA has supported lithography since 1991 for more than 1 billion US\$, it decided to stop funding maskless lithography technology as throughput is 20 to 100 times slower than current lithography. According to Anthony Tether, Director for de la DARPA, mask-

less lithography is interesting for low to medium volume production of specific circuits but cannot answer to DoD request. Main lithography players (ASML, Canon and Nikon) have also decided to stop their research program following DARPA's announcement. For 2006, DARPA will increase its funding for 3D Microsystems integrating sensors, actuators, energy sources and wide-bandgap circuits for RF and high power applications.

<http://www.darpa.mil/mto/index.html>

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Techno News

Freescale marks one year of 90-nm success and announced plans to start 65-nm in November 2005

Freescale Semiconductor celebrates one year of technology leadership and manufacturing production at the 90-nanometer (nm) technology node. Since initiating manufacturing of 90-nm product designs on 300-millimeter (mm) wafers in October 2004, Freescale has introduced 12 new products

on 90-nm low-power CMOS technology. Freescale's 90-nm products include digital, analogic, RF and embedded memory devices for diverse end applications, such as wireless handsets, printers, enterprise networking components and wireless infrastructure equipment. Freescale Semiconductor has also announced plans to move to 65nm prototyping in November through its Crolles2 partnership with STMicroelectronics and Royal Philips Electronics.

<http://www.freescale.com>

IMEC and Infineon realize a new profiling technique for Ni-based non-volatile flash memory

IMEC and Infineon Technologies developed a novel profiling technique for the accurate extraction of charge profiles in nitride-based memory, which allowed for the optimization of write/erase voltages using a novel operating mode. This result may overcome the major reliability problems of nitride-based memory, which hampered their competitiveness on the non-volatile Flash market. These results open perspectives for both high cycle applications (1,000,000 cycles have been demonstrated without verify) as well as for high retention applications (such as stand-alone code storage and automotive micro-controllers).

<http://www.imec.be>
<http://www.infineon.com>

Samsung develops 70-nm based DDR2

Samsung Electronics Co., Ltd. has announced the development of a 512-Megabit (Mb) Double Data Rate, Two Synchronous Dynamic Random Access Memory (DDR2 SDRAM) module using its proprietary 70-nanometer (70nm) lithography process. This is the smallest lithographic process technology yet applied to a DRAM device, said the company. Samsung reports that the new 70nm process technology doubles the number of chips per wafer compared to its 90nm process technology. Samsung is also reporting that the new 70nm process technology maintains continuity with the 80nm and 90nm processes it is currently using in most of its DRAM production.

<http://www.samsung.com>

"SiC 05": 2003-2009 Silicon Carbide Market analysis

▶ Power Devices market will increase competition between SiC suppliers...

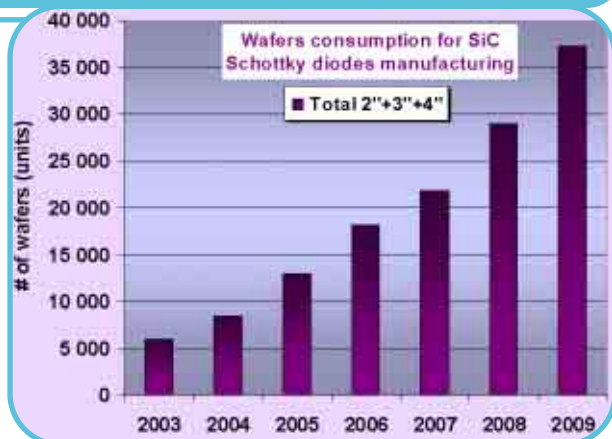
Yole Développement has edited an update of the report "SiC market analysis" describing the current structure of the Silicon Carbide industry, the applicative markets, the main players' business models and its possible evolutions...

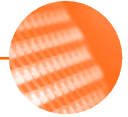
The report is now presenting unique features:

- Detailed analysis of 2003-2009 SiC markets from a material point of view.
- Current production level, selling prices evolution and potential perspectives.
- Description of devices in production or in R&D with associated markets and volumes.
- Cree's business model evaluation with estimated external and internal SiC revenues and use.
- Applicative markets targeted by SiC with worldwide players' description, main challenges for market penetration, technical status, possible break-through and roadmaps. These applications includes: power electronics, RF & microwave, optoelectronics, MEMS and sensors.

The report is made of an analysis of more than 200 PowerPoint slide plus 80 profiles of worldwide SiC players
 Price: Euros 3,900/USD 4,700.

Contact: David Jourdan, Tel: +33 472 83 01 90, Email: jourdan@yole.fr, website: www.yole.fr





Techno News

TSMC ready to accept 90nm X architecture designs

Taiwan Semiconductor Manufacturing Company announced that it is ready to accept 90nm X Architecture designs. The company has successfully qualified 90nm X Architecture design rules that can enable lower cost, higher performance and lower power designs. TSMC and Cadence Design Systems, Inc. have collaborated to validate the Cadence X Architecture design solution for the pro-

cess. The two companies are now engaging mutual customers. Earlier this year, ATI Technologies Inc., Cadence and TSMC successfully produced the foundry industry's first X Architecture device - a high-performance, high-volume PCI-Express graphics processor. ATI implemented the device using the Cadence X Architecture design solution and manufactured it on TSMC's 0.11-micron process. The design eliminated one metal layer, reducing the device's die cost.

<http://www.tsmc.com>

Alliances & Mergers

Soitec and SEZ join forces to speed industrialization of sSOI substrates

The Soitec Group and the SEZ Group announced they have initiated a joint development program (JDP) intended to speed the industrialization of next-generation strained silicon-on-insulator (sSOI) substrates. Under the terms of the JDP, the two companies will leverage Soitec's leadership in engineered substrates and SEZ's leadership in single-wafer, wet-processing technology to develop new wet-etch processes designed to optimize total germanium removal in sSOI manufacturing. Company officials report that effective and complete removal of germanium is a key step in the sSOI manufacturing process as silicon germanium (SiGe) must be used to produce the silicon-layer strain that is essential to sSOI's functionality. Ultimately, it is the combined power of this strained silicon layer and the SOI substrates that allow chipmakers to har-

ness the powerful performance and power dissipation benefits afforded by sSOI substrates.

<http://www.soitec.com>

<http://www.sez.com>

Danaher completed the sale of Leica Microsystems

Danaher Corporation announced that it has completed the sale of the semiconductor equipment division of Leica Microsystems AG to Golden Gate Capital. This divestiture was assumed as a part of the overall acquisition of Leica Microsystems AG and as a result, the company does not expect to recognize any gain or loss from this transaction. With 2004 revenues of approximately \$120 million, the semiconductor equipment division manufactures and sells microelectronic inspection equipment and lithography systems.

<http://www.danaher.com>

<http://leica-microsystems.com>

Key Data

Semiconductor sales increases sharply in August

Semiconductor Industry Association (SIA) reported worldwide sales of semiconductors increased sharply in August to \$18.6 billion, an increase of 3.2 percent from the \$18.0 billion reported in July and an increase of 1.7 percent from the \$18.3 billion reported in August 2004. SIA reported that year-to-date semiconductor sales through August, at \$144.4 billion, are up by 5.8 percent over the same period of 2004 when total sales amounted to \$136.5 billion. SIA reported that overall capacity utilization increased from 85 percent to 89 percent in the second quarter. Leading-edge capacity utilization (defined as factories employing 160-nanometer and smaller geometries) was even higher at 95 percent. SIA projects factory utilization continued to increase in the third quarter.

<http://www.sia-online.com>

August 2005 (\$ Billions)

Month-to-Month Sales	Last Month	Current Month	% Change
Market			
Americas	3.13	3.24	3.4%
Europe	3.05	3.08	1.0%
Japan	3.57	3.60	0.9%
Asia Pacific	8.27	8.67	4.8%
TOTAL	18.01	18.58	3.2%
Year-to-Year Sales	Last Year	Current Month	% Change
Market			
Americas	3.42	3.24	-5.1%
Europe	3.22	3.08	-4.3%
Japan	3.98	3.60	-9.5%
Asia Pacific	7.67	8.67	13.0%
TOTAL	18.28	18.58	1.7%

Source: SIA, October 2005

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About Yole Développement

Yole Développement is a market research and strategy consulting company, specialised in:

- MEMS & Nanotechnologies
- Compound semiconductors & optoelectronics
- Equipment and materials for the production of semiconductor devices
- Life sciences instrumentation

Yole Développement offers various kinds of services:

- Custom market research and technology/strategy analysis
- Marketing and communication services through MicroNews
- Market reports



Jean Christophe Eloy is the founder and Managing Director of Yole Développement.

Founded in 1998, Yole Développement is the world leader in the analysis of the microtechnologies and compound semiconductors markets. Each day, Yole Développement's team of 18 consultants is in contact with worldwide key industrial companies, R&D institutes and investors in order to help them to understand the markets and technology trends. In its analysis, Yole Développement takes into account the complete value chain including materials and equipment suppliers, device & system manufacturers and devices users.

To meet us at exhibitions

- **Conférence Nanoroadmap**, 23 November 2005, Lyon, France, 9-13 October, please contact Barbara Pieters at pieters@yole.fr
- **Semicon Japan**, 7 - 9 December 2005, Tokyo, Japan, please contact Jean-Christophe Eloy at eloy@yole.fr
- **MEMS 2006**, Istanbul, Turkey, please contact Jean-Christophe Eloy at eloy@yole.fr
- **AICHe Spring Meeting**, April 2006, Orlando, USA, please contact Jean-Christophe Eloy at eloy@yole.fr

Top 5 Reports

1 - Led2light 2006: HB-LEDs for general illumination and automotive lighting

Overview of market and technology trends for HB LEDs in general illumination and automotive lighting and make a focus on the major players worldwide (company profiles). In term of security, LEDs have fast reaction time: LEDs light up around 250 milliseconds quicker than bulbs. Available since November 2005
Price: Euro 3,900 / US\$ 4,700

2 - SiC 2005: material, devices & applications

An evaluation of the 2002-2007 SiC market and analysis of the major technology and industrials trends + 80 pages of detailed players profiles. Yole Développement has edited an update of the report "SiC market analysis" describing the current structure of the Silicon Carbide industry, the applicative markets, the main business models (Cree, Infineon...) and its possible evolutions. Available since October 2005
Price: Euro 3,900 / US\$ 4,700

3 - Silicon Microphone Market 2005: From Si microphones to acoustic modules

Complete analysis of the silicon microphones market players and technologies with unique features like Technology and product development for microphones applications, comparison of the different approaches of the device manufacturers (business models and technologies), key manufacturing process requirements and critical manufacturing steps and industry development status, risk analysis on the existing business model. Available since September 2005
Price: Euro 3,300 / US\$ 3,950

4 - World Inertial Sensor Market 2005: new version available now

Yole Développement has edited a new report describing the major MEMS inertial sensor markets and applications. This is a major update of the 2004 version. This report provides a complete analysis of the micromachined acceleration sensors and gyroscopes applications and markets. Available since May 2005
Price: Euro 2,900 / US\$ 3,500

5 - And still: MEMS for mobiles, Status of the MEMS industry, Optical MEMS markets,

Wide band gap materials markets, MEMS Equipment markets...

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www.infoshop-japan.com/publisher/YD.shtml