

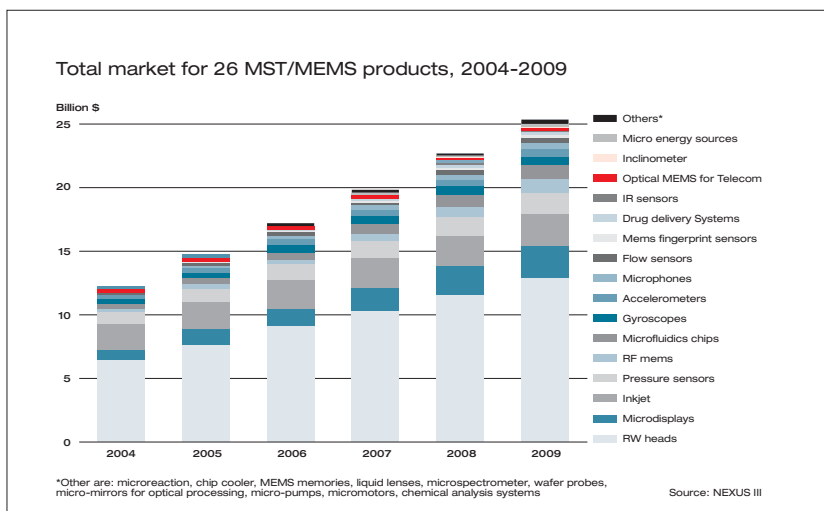


NEXUS

NEXUS Market Analysis for MEMS and Microsystems III, 2005-2009

Microsystems (including MST/MEMS) sensors and actuators are consolidating their position in established markets and finding new applications, leveraging a combination of low manufacturing costs, compact size, low weight and power consumption, as well as increased intelligence and multi-functionality.

Over the next five years, this market is predicted to grow at a rate of 16% per year from \$12 billion in 2004 to \$25 billion in 2009 across a spectrum of 26 MEMS/MST products. Employing the historical definition given by NEXUS – the smallest unit containing MEMS that is commercially available – the market will grow from \$ 36 billion to \$ 52 billion in 2009.



Driving these markets are read/write heads, micro-displays and inkjet heads. Of particular note, however, is the predicted meteoric growth of the consumer electronics segment, a market that is forecast to treble over the period 2004 to 2009.

Stay up-to-date with NEXUS

NEXUS Market Analysis for MEMS and Microsystems III, 2005-2009 is a reliable resource for MEMS and Microsystems products and applications.

It builds on the world renowned reputation

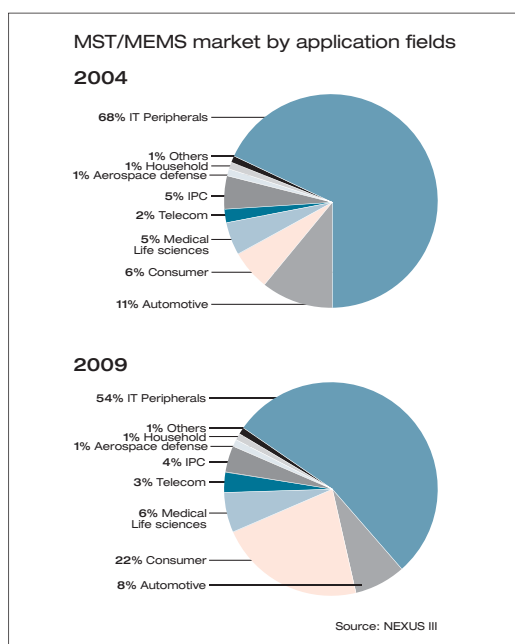
of previous NEXUS reports covering 1998-2002 and 2000-2005. The third NEXUS report continues to describe market winning technologies and provide the kind of actionable intelligence that gives you a head-start in existing and new high potential opportunities - microdisplays, microphones, tire pressure monitors and RF MEMS - business information that will improve your margins.

26 products described in detail

In total, the report details opportunities for 26 MEMS/MST products. Chief among these are read/write heads with 50 % share and microdisplays, which will overtake inkjet heads in 2009 as Texas Instruments forges ahead with the DLP chip for front projectors and rear projection TVs. Fast growing markets for microphones, RF MEMS, and tire pressure monitors are examined next to established pressure and motion sensors, which are increasingly driven by consumer applications.

Emerging markets include wafer probes, micro-motors, micro-spectrometers, micro-pumps and micro-reaction products. NEXUS also considers products that will begin to impact markets at the end of the decade, namely micro fuel cells, MEMS memories and e-fuses, chip coolers and liquid lenses for autofocus/zoom in camera phones. No other report offers this breadth of coverage.

Each product is described in terms of function, MST advantage, and market opportunity up to 2009. Important trends, e.g. technology drivers, legislative barriers and opportunities, are identified and placed into the context of market figures. Breakouts include price targets, unit volumes, product specifications and time-to-market.



Applications and trends dissected

NEXUS III breaks out the complete application fields for MST/MEMS (see figure). Each application is described and cross-referenced with products to give a sector-wide overview of MEMS and Microsystems activities. Key manufacturers are identified in each sector. All assessments are validated with senior experts from leading companies including Bosch, HL Planar, Infineon, Nokia, Olivetti, Philips and Roche Diagnostics. New to this report is a regional analysis of the MEMS/MST industry.

Coordinated by WTC-Wicht Technologie Consulting, NEXUS Market Analysis III, 2005-2009 is available in December 2005, priced at 1.100,00 Euro, excl. VAT.

How to order

If order form is not attached, please download from: www.enablingmnt.com or contact: Patric Salomon, 4M2C PATRIC SALOMON GmbH
E-Mail: info@4m2c.com, Phone: +49 30 24357870

In addition, the NEXUS Product-technology Roadmap for Microsystems and the enablingMNT Industry Review Series are available from 4M2C.

Table of Contents

Table of contents

1. Introduction
2. Executive Summary and Conclusion
3. Task Force and Contributing Experts
4. Methodology and Definitions
5. Evaluation of the NEXUS Market Analysis 2000-2005
6. MST Application Fields
 - Automotive
 - IT peripherals
 - Consumer and Lifestyle Products
 - Telecommunications
 - Medical and Life Sciences
 - Household Appliances
 - Industrial Process Control
 - Aerospace, Defence and Homeland Security
7. MST Products
 - Read-Write Heads
 - Inkjet heads
 - Microdisplays
 - Pressure sensors
 - Flow sensors
 - Accelerometers
 - Gyroscopes
 - IR sensors
 - Microfluidics chips
 - Optical MEMS for Telecom
 - Microspectrometers
 - Chemical analysis systems
 - Inclinometers
 - RF Mems
 - Microphones
 - Drug delivery systems
 - Micro energy sources
 - Micro-reaction products
 - Micro Cooling Devices
 - MEMS memories and efuses
 - Micromachined wafer probes
 - Micropumps
 - Micro-mirrors for Optical Processing
 - Micromotors
 - MEMS Fingerprint
 - Auto-focus and zoom lenses
8. Regional Analysis
 - MST/MEMS in North America
 - MST/MEMS in Europe
 - MST/MEMS in Asia



Product-technology Roadmap for Microsystems

A NEXUS Task Force Report

September 2003



The NEXUS Association promotes the uptake of Microsystems by analysing market opportunities and by producing technology roadmaps for MST/MEMS products and applications. Directed, primarily, by application-driven technology users, NEXUS has championed such tasks to provide the strategic guidance required for industry and research.

Executive Summary of **The NEXUS Product-technology Roadmap for Microsystems**

This Microsystems product-technology roadmap report, issued collaboratively by the NEXUS Roadmap Task Force and the participants of the NEXUS User Supplier Clubs, provides a viewpoint of the predictions and forecasts associated with the main applications likely to be impacted by microsystems and microtechnologies.

The document is aimed at assisting those companies involved in different industrial sectors to understand how the evolution of Microsystems Technology (MST) can be used effectively to enhance their future products. It is also to assist those organisations involved in MST to understand where the future applications may be.

The roadmaps are “applications-driven”, whereby trends for future application areas and products have been identified and their “in-service” dates forecasted. In this context, the underlying microsystems technologies provide the basis of the secondary layers constituting the roadmaps. The report addresses the below-mentioned areas of applications, chosen to align with the specific topics allocated to the NEXUS User Supplier Clubs.

Within each of these chosen areas of applications, the most important examples were identified on the basis of current/potential growth and potential impact of MST. Both short-term forecasts and long-term visions are described. It is shown how so-called “Megatrends” such as socioeconomic developments, mobility, communication, natural resources etc. influence MST development in the above-mentioned areas. The results represent the views of the members of the Task Group and of the User-Supplier Club dedicated to their area of expertise.

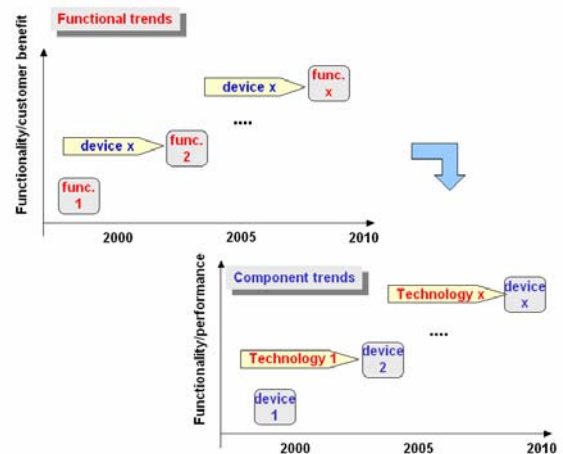
Report contents

Introduction

Trends in Selected Application Areas

- Automotive
- Multimedia & Peripherals
- Telecommunications
- Pharmaceutical
- Medical Devices
- Household Applications
- Aeronautics, Defence & Space
- Lifestyle
- Cross-Application Technologies

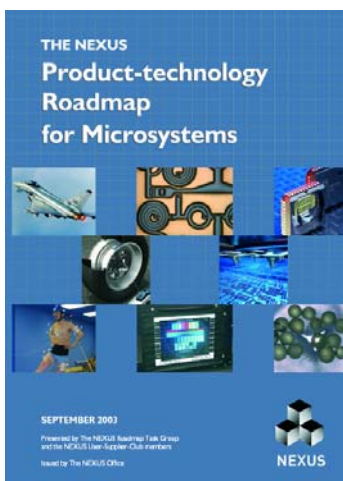
Conclusion



NEXUS Methodology

Task force members and main contributors:

- H. Zinner, EADS GmbH (D), co-ordinator
- A. El-Fatary, BAE SYSTEMS (UK)
- P.G. Gloersen, SensoNor (N)
- D. Hodgins, ETB (UK)
- R. Lawes, RAL (UK)
- C. Legge, Glaxo-Smith-Kline (UK)
- G. Menozzi, Memscap (F)
- P. Salomon, 4M2C PATRIC SALOMON (D)
- G. Tschunela, SGT Sensor Consulting (D)
- F.v.d. Weijer, RPC, (NL)
- H. Wicht, WTC (D)



NEXUS Market Analysis for MEMS and Microsystems III, 2005-2009

January 2006

Product-technology Roadmap for Microsystems

September 2003

enablingMNT Industry Review Series



ORDER FORM

Customer:

First name:		Last name:	
Organisation:			
VAT-ID number (European organisations only):			
Address:			
Phone:		Fax:	
E-Mail:		Web:	

Order for:

	Price per copy in €	Number of copies	Total order in €
The NEXUS MST Market Analysis III 2005 - 2009 2006, Hardcopy only , sent by Express Mail	1100 €		
The NEXUS MST Market Analysis III 2005 - 2009 2006, CD only , sent by Express Mail	1100 €		
The NEXUS MST Market Analysis III 2005 - 2009 2006, Hardcopy and CD , sent by Express Mail	1300 €		
The NEXUS Product-technology Roadmap for Microsystems 2003, Hardcopy , sent by Express Mail	200 €		
Bundle of the NEXUS Product-technology Roadmap for Microsystems and the NEXUS MST Market Analysis III 2003/2006, both in Hardcopy , sent by Express Mail	1200 €		
Bundle of the NEXUS Product-technology Roadmap for Microsystems and the NEXUS MST Market Analysis III 2003/2006, Roadmap Hardcopy and Market Report CD , sent by Express Mail	1400 €		
enablingMNT Industry Reviews 2003/2006 PDF File, sent by Email ----- (select from reviews list)	280 €		
Packaging & Shipping cost (Germany: €10, within EU: €40, other regions: €60)			
7% VAT to be added for EU customers without valid VAT-ID, and for all German customers			

Payment:

Cheque enclosed	<input type="checkbox"/>
Bank transfer	<input type="checkbox"/>
Credit card payment is not available so far	<input type="checkbox"/>

Date, Signature

Please send or fax to 4M2C PATRIC SALOMON GmbH
 Fax: +49 721 1515 82528 or +49 69 1330 6496 55