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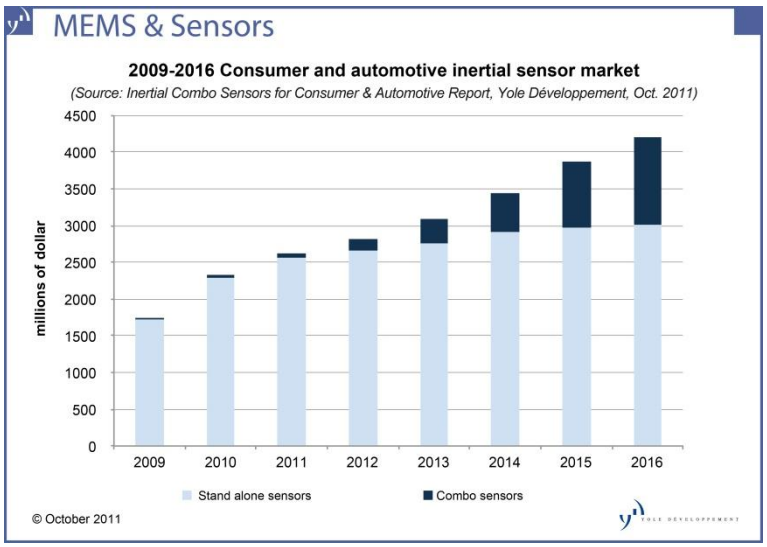
"2016, 40% of the value of consumer market will come from combos" announces Yole Développement

"Inertial Combo Sensors for Consumer & Automotive", A report from Yole Développement

*Lyon, France – Nov 2nd, 2011 – Yole Développement announces its report "**Inertial Combo Sensors for Consumer & Automotive".** Very large market opportunity and supply chain needs to adapt, are the main trends identified by Yole Développement's Technology & Market analyst, Laurent Robin.*

Market overview

"The inertial sensor market for consumer and automotive will see healthy 15% growth this year to surpass $2.6 billion, thanks to the increasing penetration of more motion sensing into more mobile devices, and more automotive safety systems in more cars across the globe" explains Laurent Robin, Technology & Market Analyst at Yole Développement. Though unit growth will continue at double digit rates, maturing markets and continued price erosion means sales revenues from discrete inertial sensors will level off and start to decline over the next several years.



Growth will then come largely from combination sensors, which Yole Développement project will jump from very tiny volumes currently to penetrate some 40% of the $2.7 billion consumer inertial market and more than 12% of the $1.1 billion automotive inertial market by 2016. This report is focused on the analysis of the opportunities and the challenges for inertial combo sensors in those high-volume market areas.

One clear motivation for combo sensors is the possibility to reduce both cost and footprint by combining the two sensors into one package with a single ASIC. However this cost benefit is not yet obvious with the dynamism of the evolution of each individual sensor. Such benefit will be very application dependent. Lower cost units combining multiple MEMS sensors are poised for healthy growth, starting with ESCs, bringing opportunity for new players and demands for sensor management solutions. This trend is showing up first in the more mature automotive MEMS sector, where the price of the sensor unit for the electronic stability control system (ESC) can now be significantly reduced, by combining the accelerometer and the gyroscope in one package with one ASIC. Adoption is a little slower on the consumer side, where the fast changing technology means discrete device prices are still falling rapidly, so products from even six months before have less of a cost advantage. But the consumer market's fast model turnover and short replacement cycles means that once the economics become compelling and adoption starts in 2012-2013, market penetration will be faster and deeper than on the automotive side.

Evolution of the supply chain

Yole Développement expects big changes as well in the supply chain, as prices will continue to drop, and a host of players along the complex new value chain all scramble to figure out how best to compete and cooperate for the much bigger business of integrating the silicon sensors into useful functions. Despite the complexities of designing and fabricating MEMS devices, most of the value in these functions is not actually in the fabrication of the MEMS die. ASIC, packaging, test & calibration and software production costs make up a significant part of the cost, and this will gain importance with the trend for multisensory packages.

Complexity of the sensor fusion

The second key motivation from combo sensors relies on sensor fusion. New functionality can now be offered using multiple sensing elements. Yole Développement sees a strong evolution from sensors to solutions. This is an opportunity for players in the MEMS industry to compensate for the drastic decrease in price by selling high value solutions that include more software content. Who will capture the added value of these smart sensor systems? There is likely room for multiple alternatives, with the sensor makers supplying the algorithms to combine and cross-calibrate the sensor data and do some standard applications, while the software and chipset makers supply the higher level, specialty functions. Combo sensors require more complex software for the sensor fusion calculations, and those will likely need to be done on an MCU, not just the usual ASIC. This is driving changes in the supply chain, as makers of microcontrollers, software, and subsystems start to take over more of the sensor management.

About Inertial Combo Sensor for Consumer & Automotive report:

- **Author:**

Laurent Robin is in charge of the MEMS & Sensors market research at Yole Developpement. He previously worked at image sensor company e2v Technologies (Grenoble, France). He holds a Physics Engineering degree from the National Institute of Applied Sciences in Toulouse, plus a Master Degree in Technology & Innovation Management from EM Lyon Business School, France.

- **Catalogue price**: Euros 3,990.00 (single user license) - Publication date: Nov. 2011. For special offers and the price in dollars, please contact David Jourdan (jourdan@yole.fr or +33 472 83 01 90).
- **Companies cited in the report:**

Acutronic, Advanced Microsensors, Advancedmicrofab, Aichi Steel, AKM, Alps Electric, Amazon, AMS, Analog Devices, AP M, Apple, ASTRI, Atmel, Autoliv, Baolab, BMW, Bosch, Broadcom, BWI , BY D, Casio Micronics, CEA LETI , Chevrolet, Chrysler, Continental, CSR, Daesung, Dai Nippon Printing, Daihatsu, Dalsa, Deep Di Semiconductor, Delphi, Domintech, Eastman Kodak, EM Microelectronics, Epson Toyocom, Fairchild, Ford, Foxcon, Fraunhofer ISIT , Free / Iliad, Freescale, Fujitsu, FullPower, Futaba, Garmin, GE, Global Foundries, Google, Hana Microelectronics, HDK Kokuriku, Hillcrest Labs, Honeywell, HT C, IMU Solution, InvenSense, IT RI, Jyve, Keynetic, Kionix, Kyocera, Lancia, Lenovo, LG, Lingsen Precision Industries, Logitech, Mando Corp, Maxim, Mcube, Mediatek, Memsic, Memsmart, Memstech, Micro Infinity, Microchip, Microsoft, Mitsubishi, Mobius, Mio, Motorola, Movea, Murata, Navteq, Nike, Nintendo, Nissan, Nokia, NT DoCoMo, Nuvoton Technology, Pace, Pacific, Palm, Panasonic, Parrot, Pixart, PointInside, Prolific Technology, Qualtre, Renault, Ricoh, RIM, Rohm, Rood Microtec , Samsung, Schraeder, Seagate, Seiko Epson, Seiko NP C, Senodia, Sensitec, Sensonor, SensorDynamics, SensorPlatforms, Sharp, SiliconLabs, Sitronix Technology, Skyartec, SMK , Sony, Sony Ericsson, SPIL , SSS, ST Microelectronics, Sunrex, Systron Donner, Takata, Technitrol, TI , TMT, TomTom, Toshiba, Toyota, Tronics, Trusted Positioning, TRW, TSMC, Universal Electronics, Virtus Advanced Sensors, VTI, Wacoh, Western Digital, Wolfson, Wolkswagen, XSens, Yamaha, Yishay Sensor, ZillionTV , ZTE …

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