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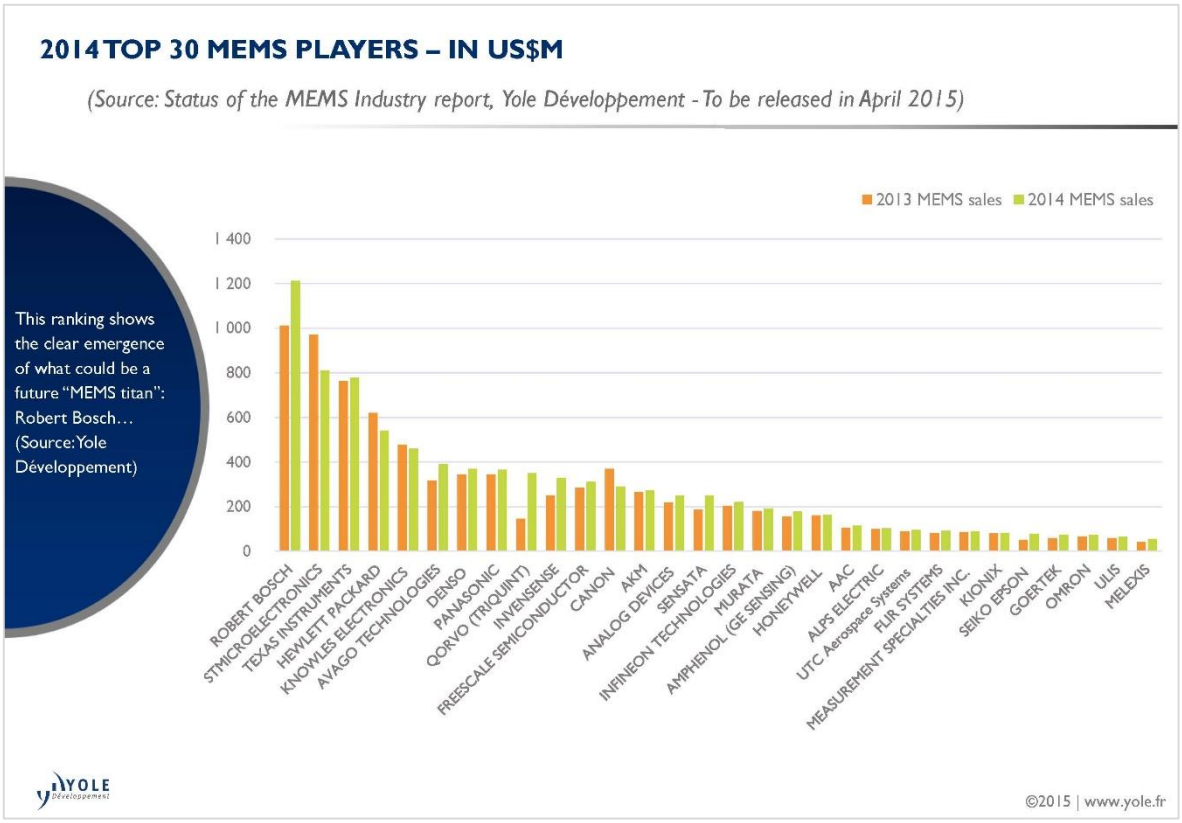
2014 top MEMS players ranking: Rising of the first MEMS titan



LYON, France – March 24, 2015 *– With an impressive 20% growth in MEMS revenue compared to 2013, and sales revenues of more than $1.2B, Robert Bosch GmbH is the clear #1.*

From Yole Développement's yearly analysis of "TOP 100 MEMS Players", analysts have released the "2014 TOP 20 MEMS Players Ranking". This ranking shows the clear emergence of what could be a future "MEMS titan": Robert Bosch (Bosch). Driven by MEMS for smartphone sales – including pressure sensors -, Bosch's MEMS revenue increased by 20% in 2014, and totaling $1.2B. The gap between Bosch and STMicroelectronics now stands at more than $400M

"The top five remains unchanged from 2013, but Bosch now accounts for one-third of the $3.8B MEMS revenue shared by the top five MEMS companies. Together, these five companies account for around one-third of the total MEMS business", details **Jean-Christophe Eloy, President & CEO, Yole Développement (Yole)**. *"It's also interesting to*

see that among the top thirty players, almost every one increased its revenue in 2014", he adds.

In other noteworthy news, Texas Instruments' sales saw a slight increase thanks to its DLP projection business. RF companies also enjoyed impressive growth, with a 23% increase for Avago Technologies (close to $400M) and a 141% increase for Qorvo (formerly TriQuint), to $350M.

Meanwhile, the inertial market keeps growing. This growth is beneficial to InvenSense, which continues its rise with a 32% increase in 2014, up to $329M revenue. Accelerometers, gyroscopes and magnetometers are not the only devices contributing to MEMS companies' growth. Pressure sensors also made a nice contribution, especially in automotive and consumer sectors. Specifically, Freescale Semiconductor saw a 33% increase in pressure revenue, driven by the Tire Pressure Monitoring Systems (TPMS) business for automotive.

On the down side, ink jet head companies still face hard times, with Hewlett-Packard (HP) and Canon both seeing revenues decrease. However, new markets are being targeted. Though thus far limited to consumer printers, MEMS technology is set to expand into the office and industrial markets as a substitute for laser printing technology (office) and inkjet piezo machining technology (for industrial & graphics).

"What we see is an industry that will generally evolve in four stages over the next 25 years. This is true for both CMOS Image Sensors and MEMS", explains **Dr Eric Mounier, Senior Technology & Market Analyst, MEMS devices & Technologies** at Yole. He explains: *"The "opening stage" generally begins when the top three companies hold no more than 10 – 30% market share. Later on, the industry enters the "scale stage" through consolidation, when the top three increases its collective market share to 45%."*

According to Yole, the "More than Moore" market research and strategy consulting company, MEMS industry has now entered the "Expansion Stage". *"Key players are expanding, and we're starting to see some companies surpassing others (i.e. Bosch's rise to the top). If we follow this model, the next step will be the "Balance & Alliance" stage, characterized by the top three holding up to 90% of market share",* comments Dr Mounier.

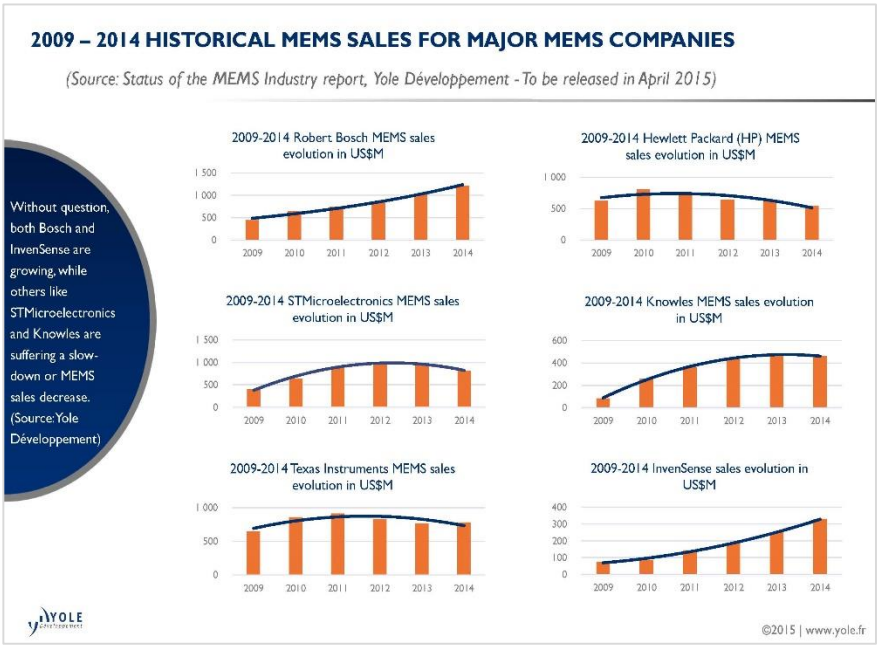
Among the 10 or so MEMS titans currently sharing most of the MEMS markets, Yole's analysts have separated them into two categories:

- "Titans with Momentum" and "Struggling Titans". In the first category we include Bosch, InvenSense, Avago Technologies and Qorvo. Bosch's case is particularly noteworthy, since it's

currently the only MEMS company with dual markets (automotive and consumer) and the right R&D/production infrastructure.

- On the "Struggling Titans" side, Yole identifies STMicroelectronics, HP, Texas Instruments, Canon, Knowles, Denso and Panasonic. These companies are currently struggling to find an efficient growth engine.

The figure below, entitled *"2009-2014 Historical MEMS Sales for Major MEMS Companies"* summarizes the 2009 – 2014 historical sales for six major MEMS companies.



Without question, both Bosch and InvenSense are growing, while others like STMicroelectronics and Knowles are suffering a slow-down or MEMS sales decrease.

Another interesting fact about Yole's 2014 TOP MEMS Ranking is that there are no new entrants (and thus no exits).

More market figures and analysis on MEMS, the Internet of Things (IoT) and wearables can be found in Yole's 2014 IoT report (Technologies & Sensors for Internet of Things: Business & Market Trends, June 2014), and the upcoming "Sensors for Wearables and Mobile" report (Detailed description available soon on I-Micronews.com, reports section).

Also, Yole is currently preparing the 2015 release of its "MEMS Industry Status" (12th edition). This will be issued in April and will delve deeper into MEMS markets, strategies and players analyses.

About the report High-End Gyroscopes, Accelerometers and IMUs for Defense, Aerospace & Industrial report

Defense applications still represent half of the market, while commercial aerospace and industrial applications are driving future growth. But MEMS will be a game-changer, leading to the emergence of many new applications requiring high performance, low-c …

Publication date: Feb. 2015 – Detailed description: Here

About the Status of the CMOS Image Sensor Industry report

Reaching $10B for the first time, the CMOS Image Sensor Industry (CIS) is undergoing massive technology and market shifts, while growing at a 10% CAGR.

Publication date: Jan. 2015 – Detailed description: Here

About the 6 and 9-Axis Sensors Consumer Inertial Combo Sensors report

Combo sensors continue their growth in a market expected to reach $1.4B in 2019, overcoming discrete sensors. Cellphones and tablets still drive the market but wearables will soon take their place in the landscape.

Publication date: Nov. 2014 – Detailed description: Here

And also:

- **Technologies & Sensors for the Internet of Things: Businesses & Market Trends 2014-2024 report (Jun. 2014)**
- **MEMS & Sensors for Mobile Phones and Tablets report (Jun. 2014)**

Coming soon: Status of the MEMS Industry, 2015 Edition.

For further information about our reports, please contact David Jourdan (jourdan@yole.fr).

About Yole Développement – www.yole.fr / www.i-micronews.com

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics. The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

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