“Driven by smartphones & microfluidics, emerging MEMS will account for 10% of the value of the total MEMS business by 2018”, announces Yole Développement.

“Emerging MEMS 2013”, a report from Yole Développement


Innovation in MEMS stays very active

Innovation in MEMS no longer comes solely from new devices, but also from the integration of mature MEMS technologies into new applications. Along with mature devices used for new applications (e.g. pressure for LBS), innovation in new MEMS devices is still active and will continue to strongly participate to the MEMS market growth in the next 5 years.

This Yole Développement report on emerging MEMS looks at the new MEMS technologies that, as a group, are expected to represent almost 10% of the value of the general MEMS market by 2018. The market will be mainly driven by medical applications – especially pharmaceutical research through DNA sequencing – and by consumer applications through innovations in mobile phones. Most of this growth is expected to take place after 2015, once products have been qualified and are suitable for volume manufacturing.

Emerging MEMS challenge: Dream vs. Reality

The dream:

After several decades of commercial existence, MEMS devices can now rely on a solid foundation for new developments. The time from R&D to commercialization has shrunk over the years, from 21 years for pressure sensors back in the 60’s to 11 years for oscillators. MEMS devices have been successful in fields with very high volumes, and have been proven capable of generating big profits. When you look at MEMS devices, you think about large volumes, and inexpensive devices; all aiming at the golden nugget that is the consumer market. This is where emerging MEMS devices try to go!

The reality:

An important barrier still exists for new devices: the cost reduction step before commercial ramp up. Most of the emerging MEMS companies are fabless start-ups that rely on the large worldwide MEMS foundry capabilities. These start-ups with new MEMS-based devices such as micro speakers, autofocus or micro-fuel cells aim at the consumer market for their commercial entrance. But this is without going through the usual “small volumes” phase in niche markets that can enable progressive cost reduction and product maturation. Those companies now face a great challenge: the price pressure of the consumer market.
This ambition to go fast and rapidly target large volumes induces numerous supply chain challenges for those emerging MEMS start-ups. They want their foundry partner to be able to provide fast process transfer, to have fast yield improvement, and provide full solutions from front-end to packaging. This is one of the reasons why some MEMS developments, long awaited for, are still a few years away from mass commercialization.

On the other hand, some emerging technologies – often developed by larger companies that are already involved in the targeted field – go through the standard ramp-up process, targeting niche applications that require MEMS advantages while improving their product to enlarge their spectrum. This is what can be seen with MEMS switches for example. They address niche markets of pill cams or ATE (Automated Test Equipment) for now, but can potentially address the billion units market of reed switches in the longer term. Nevertheless those examples tend to remain marginal.

**Emerging MEMS driving forces**

Yole Développement has identified a total of 15 emerging MEMS technologies that are supposed to enter the market within the next 5 years, with – or without – commercial success. Most of those developments have been motivated by the same 3 forces:

- The smart phone industry
- The home-care industry
- The Internet of things

This implies that the promise of a potential large market is a strong driver for today’s developments. Too bad for smaller industries that could also benefit from MEMS unique functionalities, but investments follow the buzz. MEMS development still requires strong backing to survive the at-least-10-years between R&D and first commercialization.
Looking only at large volume markets is risky due to strong commercial barriers, but it can also be a good bet: the autofocus market is expected to reach $450M by 2018 and chemical sensors market should reach $185M in 2018.

The future for MEMS devices

The MEMS industry has a strong future; despite the global economic downturn, innovation is still there. Nevertheless what must be understood is that commercial success takes some time, and there is no fast lane to success. Even though development time gets shorter and shorter, emerging technologies will still have to go through the usual cost reduction phase, and wait for market acceptance. The MEMS industry is one of those rare high-tech industries where innovation needs time.

About the report “Emerging MEMS 2013”

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  For special offers and the price in dollars, please contact David Jourdan (jourdan@yole.fr).

- **Companies cited in the report:**


Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media in addition to corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, 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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