

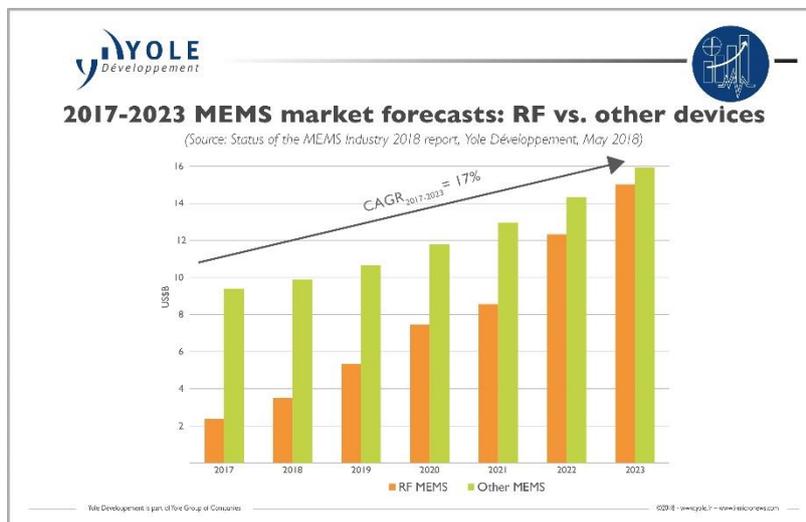


FOR IMMEDIATE RELEASE:

The MEMS market is showing a 17.5% CAGR¹ between 2018 and 2023, strongly supported by current mega trends

Extracted from: Status of the MEMS Industry report, Yole Développement, May 2018

LYON, France – May 31, 2018: “MEMS² market will experience a 17.5% growth in value between 2018 and 2023, to reach US\$ 31 billion at the end of the period,” asserts **Dr. Eric Mounier, Principal Analyst, MEMS & Photonics, at Yole Développement (Yole)**. “The consumer market segment is showing the biggest share, with more than 50%³. The good news is that almost all MEMS devices will contribute to this growth.” However, the RF industry is still playing a key role in the MEMS industry development. Excluding RF, the MEMS market will grow at 9% over 2018 - 2023. With RF MEMS devices, CAGR reaches 17.5% during the same period. Driven by the complexities associated with the move to 5G and the higher number of bands it brings, there is an increasing demand for RF filters in 4G/5G, making RF MEMS (mainly BAW filters) the largest-growing MEMS segment...



Yole releases today its annual MEMS technology & market analysis: [Status of the MEMS Industry](#). This 2018 edition presents the MEMS device market along with key industry changes and trends. The market research and strategy consulting company is following the MEMS industry for a while, tracking more than 200 applications and 300 MEMS companies. This report is a significant combination all of

these applications into more than 15 major MEMS devices. This 15th version includes: global macro economical megatrends and their impact on MEMS and sensors business – MEMS and sensors market forecast – manufacturers rankings – analysis by device and application ... Detailed description on [i-micronews.com, MEMS & Sensors reports section](#).

¹ CAGR : Compound Annual Growth Rate

² MEMS : Micro Electro Mechanical System

³ In value

Amongst the numerous existing MEMS devices, inkjet heads will grow, with the consumer market representing more than 70% of printhead market demand. This market recorded its first signs of recovery in the first half of 2017, a trend confirmed in the second half of the year. This recovery was noticed both in disposable and fixed printheads. Most consumer players show discernable growth: for example, HP has recorded a 2% growth in consumer printer revenue since 2016, and Canon has confirmed a progression in sales for inkjet printers, with strong demand in Asia.

Numerous pressure sensor applications also contribute to market expansion. Indeed, it is interesting to see that, although it is one of the oldest MEMS technologies, pressure sensor keeps growing. In automotive, pressure sensors have the highest number of applications, with many advantages such resistance to toxic exhaust gas and harsh environments, higher accuracy, and the development of intelligent tires that deliver more information on tire status (especially for future autonomous cars). For consumer, mobiles and smartphones still account for 90% of pressure sensor sales, and cost reduction is the priority vs. size reduction because size is already very small. Although there are no big “killer” applications expected in the future, new applications are emerging: smart homes, electronic cigarette, drones, and wearables, to name several⁴.

Then after, are coming the MEMS microphones. Such MEMS components have been in the spotlight for a long time and have expressed one of the highest CAGRs of any MEMS technology over



the last five years. “In the range of US\$105 million in 2008, the MEMS microphone market was worth US\$402 million in 2012 and reached the US\$1 billion milestone in 2016”, asserts

Guillaume Girardin, Director of the Photonics, Sensing and Display division at Yole.

“Currently, almost 4.5 billion units are shipped annually. The main application is mobile

phones, which comprise 85% of shipment volumes, in a consumer market that makes up 98% of the total shipment volume. Tablets and PCs/laptops take second and third place, with 5% and 3.2% of total shipment volumes, respectively⁵.”

Step by step, the uncooled IR imager market keeps growing. This is due to a continuous price decrease over the last few years stemming from new technologies such as WLP and silicon lenses, as well as increasing acceptance from customers. As prices continue falling, we believe the market for uncooled IR imaging technology will continue finding new applications in the coming years. More results will be

⁴ Source : [MEMS Pressure Sensor Market and Technologies report](#), Yole Développement, 2018

⁵ Source : [Acoustic MEMS and Audio Solutions report](#), Yole Développement, 2017

detailed during the 3rd Executive Infrared Imaging Forum, powered by Yole and taking place on September 7 in Shenzhen, China: [Full program](#)
All MEMS market segments including inertial, optical MEMS, microfluidics, new micro components and more ... are deeply analyzed in Yole's annual MEMS report, Status of the MEMS Industry. A full description of this technology & market analysis is available in the MEMS & Sensor reports section, on i-micronews.com.

In this new edition, Yole's team is also analyzing the market positioning of the MEMS device manufacturers and their annual revenue. What is the status of the 2017 Top MEMS manufacturers?

- In 2017, the biggest surprise was Broadcom becoming the #1 MEMS player. As growth continues for RF, driven by an increasing number of filters/phones and by the front-end module's increasing value, it is likely that RF players will still dominate the top 2018 rankings.
- In parallel, most MEMS players showed positive growth in 2016 - 2017. Established players, Robert Bosch, STMicroelectronics and HP were "shaken" by Broadcom's growth but still performed well. For example, the German leader, Robert Bosch enjoyed growth of approximately US\$100 million. Inkjet heads players also had a good overall performance compared to previous years.

In addition, the company, SiTime displayed the most impressive growth, exceeding 100%. Other MEMS players posting significant growth are: FormFactor, benefiting from the semiconductor business's excellent health; and ULIS, with uncooled IR imaging still growing



annually into multiple applications including consumer – thermography, firefighting, night vision, smartphones, drones, and military.

In 2016, the top 30 MEMS players totaled more than US\$9,238 million. In 2017, that number increased to US\$9,881 million.

Further results, extracted from Yole's technology & market analyses will be presented by its team, during key conferences and trade shows all year long. Next dates are:

- [Sensors Expo & Conference](#) (Jun. 26-28 - San Jose, CA, USA) with two presentations from both Yole's analysts, **Guillaume Girardin**, Photonics, Sensing and Display Head of Division and **Dr. Yohann Tschudi**, **Software & Market Analyst**.
- MEMS Manufacturing (Aug. 1st – Santa Clara, CA, USA) with a presentation from System Plus Consulting's CTO, **Romain Fraux**. System Plus Consulting is a sister company of Yole.

- 1st Executive Forum on LiDAR for Automotive (Sep. 6 - Shenzhen, China). This event is powered by Yole. For more information, click: [LiDAR for Auto. Forum](#).
- 3rd European MEMS & Sensors Summit powered by SEMI (Sep.19-21 - Grenoble, France) with a presentation focused on the MEMS industry performed by **Dr. Eric Mounier, Principal Analyst, Photonics, Sensing & Displays Division**. Another Yole's presentation focused on the imaging industry is part of the program, with **Pierre Cambou, Principal Analyst, Technology & Market** as a speaker.

Click [here](#) to discover Yole's agenda.

Stay tuned!

ABOUT THE REPORT:**STATUS OF THE MEMS INDUSTRY**

Megatrends are invigorating the MEMS industry. – Produced by Yole Développement part of Yole Group of Companies.

**Companies cited in the report:**

AAC, AKM, ALPS Electric, Amphenol, ams, Analog Devices, Apple, Asia Pacific Microsystems, Boehringer Ingelheim microPARTS, Bosch, Broadcom, Canon, Colibrys, Cirrus Logic, DENSO, DRS, EPCOS, Epson, First Sensor Technology, FLIR Systems, FormFactor, Fujifilm Dimatix, GLOBALFOUNDRIES, Goertek, Hewlett Packard, Hitachi Automotive ... [Full list](#)

Author of the report:

With almost 20 years of experience in MEMS, Sensors and Photonics applications, markets, and technology analyses, **Dr. Eric Mounier** provides deep industry insight into current and future trends. As a Principal Analyst, Technology & Market, MEMS & Photonics, in the Photonics, Sensing & Display division, he is a daily contributor to the development of MEMS and Photonics activities at Yole Développement (Yole), with a large collection of market and technology reports as well as multiple custom consulting projects: business strategy, identification of investments or acquisition targets, due diligences (buy/sell side), market and technology analysis, cost modelling, technology scouting, etc.

Previously, Dr. Mounier held R&D and Marketing positions at CEA Leti (France).

He has spoken in numerous international conferences and has authored or co-authored more than 100 papers. Eric has a Semiconductor Engineering Degree and a Ph.-D in Optoelectronics from the National Polytechnic Institute of Grenoble (France).

**ABOUT YOLE DEVELOPPEMENT**

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of

companies has expanded to include more than 80 collaborators worldwide covering MEMS & Sensors - Imaging - Medical Technologies - Compound Semiconductors - RF Electronics - Solid State Lighting - Displays - Photonics - Power Electronics - Batteries & Energy Management - Advanced Packaging - Semiconductor Manufacturing - Software & Computing and more...

The “More than Moore” market research, technology and strategy consulting company Yole Développement, along with its partners System Plus Consulting, PISEO and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to grow their business. . For more information, visit www.yole.fr and follow Yole on [LinkedIn](#) and [Twitter](#).

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