

Ranking Of Top MEMS Companies

Market analysts WTC of Munich, Germany, have updated their MEMS market data with a global bottom-up survey of the top 30 MEMS companies. WTC identified and interviewed over 60 major organisations in February and March 2007 regarding their current MEMS revenues, products, applications and views of the major changes in the industry. The results are a combination of publicly available figures and validated estimates based on shipments and average selling prices.

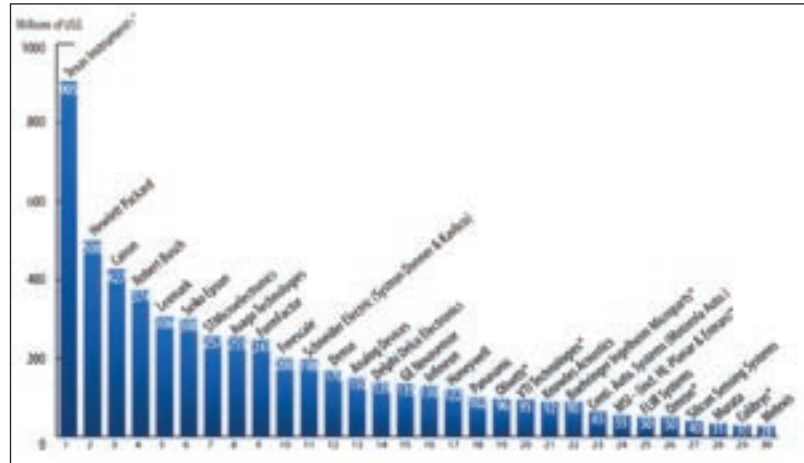


Figure 1 - Top 30 MEMS manufacturers in 2006 by revenue

With its Digital Light Processing (DLP) chips, Texas Instruments is still the number one MEMS company worldwide and established a new record in 2006 with turnover of \$905 million. Following an 8% drop in 2005, DLP revenues were up 15 percent last year. The company's front projector business remains the main revenue driver. However, WTC expects that its TV business will continue to suffer from LCD and plasma competition.

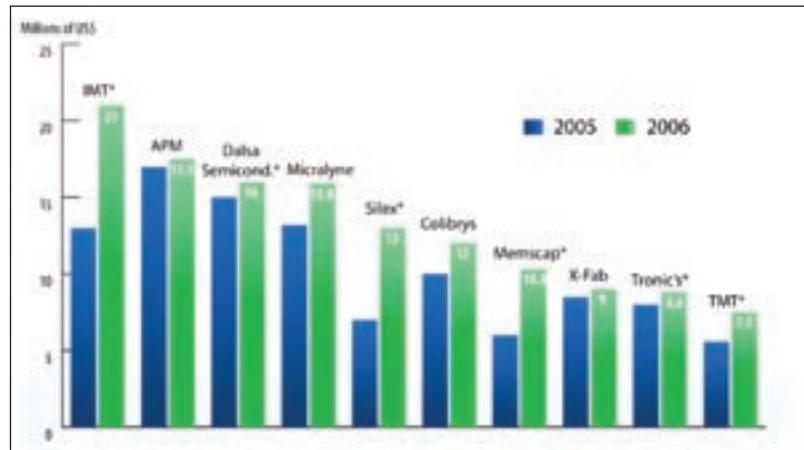


Figure 2 - Top 10 MEMS contract manufacturing revenues (dedicated MEMS fabs only; does not include STMicroelectronics and Sony)

Inkjet print heads still contribute greatly to overall MEMS revenues, with five companies in the top 10: HP, Canon, Lexmark and Seiko with their own print head production, and STMicroelectronics as a major foundry partner for HP.

The automotive sector is the next major revenue source. Bosch leads with an overall 4th position with sales of \$374 million, followed by nine other companies jostling for positions between 10th place Freescale with \$200 million and number 18 Panasonic with \$102 million. Both gyro and accelerometer sensors for vehicle

dynamics (ESP) applications and pressure sensors for tire pressure monitoring systems (TPMS) were major stimulants for automotive MEMS markets in 2006.

The performance of some additional companies was also worthy of comment, according to WTC. Avago climbs to rank 8 with \$255 million and consolidates its clear leadership in the FBAR filter business. The company shipped 220 million FBAR products last year. Formfactor, a manufacturer of MEMS-based wafer probe cards, exploded onto the market just 4 years ago and is now in 9th place,

having grown its revenues 55% in 2006. Colibrys is the only company that counts foundry services as part of its revenue, and makes it into the top 30 in 2006.

The development of the foundry business

WTC's mems10 foundries ranking counts a homogeneous group of contract manufacturing companies that specialise or perform most of their foundry business in MEMS. The revenue from MEMS contract manufacturing for these ten foundries reached \$131 mil-

lion in 2006. This business expanded by 30 percent last year.

IMT overtook APM as the leading MEMS foundry with an impressive jump from \$13 million to \$21 million based on contract manufacturing of infrared sensors, MOEMS and DC switch arrays for telecom applications. Silex showed the most aggressive performance - doubling its revenues to \$13 million in 2006, largely from sales in life sciences and telecom applications.

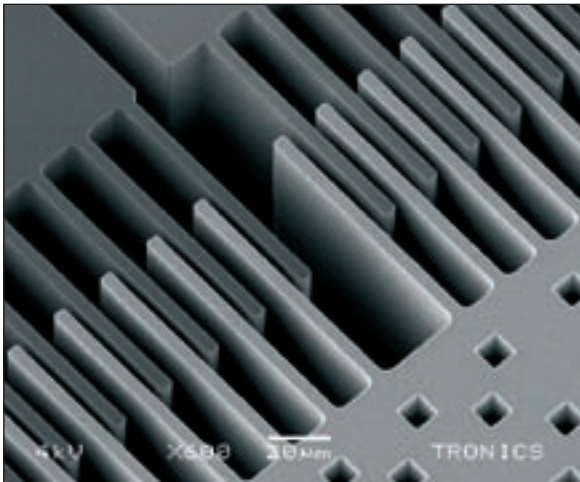
One should also mention larger semiconductor companies like STMicroelectronics and Sony. In contrast to the mems10 foundries which serve from 15 to 60 customers, these companies' MEMS foundry activity is usually focused on a key customer. STMicroelectronics has a strategic relationship with HP for the production of print-head wafers, while Sony Semiconductor Kyushu Corp (SCK) is the prime MEMS wafer supplier for Knowles acoustics. Although MEMS is a very small

part of their activity, these players actually dominate the MEMS foundry business in revenue terms. MEMS foundry revenues for STMicroelectronics and SCK is estimated to be around \$240M and \$35M, respectively.

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Project To Jointly Develop Advanced MEMS DRIE Technology

Tronics Microsystems, a global leader in manufacturing custom MEMS components for demanding applications, and Alcatel Micro Machining Systems (AMMS), a leading manufacturer of deep reactive ion etching (DRIE) systems for MEMS and 3D semiconductors, have announced a joint development project (JDP) on DRIE for extreme-performance MEMS.



The collaboration will leverage the companies' complementary strengths to develop next-generation advanced DRIE process technology for high-performance MEMS and to establish a new performance benchmark for the MEMS industry. Recognised for its high-aspect-ratio micromachining technologies for custom inertial transducers, Tronics will utilise its robust test protocols to evaluate and qualify new, advanced DRIE manufacturing processes from AMMS, and will provide SPC feedback. With that data, AMMS will build on its DRIE leadership by further enhancing its process solutions for new, advanced high-aspect-ratio, high-yield and manufacturing-proven processes. In return, Tronics will receive priority access to the company's latest process modules and quality services.

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Success In Paris For MEMS And MOEMS

The first Smart Systems Integration, European Conference & Exhibition on integration issues of miniaturised systems, took place from 27-28 March 2007 in Paris. The conference attracted 285 participants from 16 European and 6 other countries. 22 exhibitors and 3 represented companies presented products and services relevant for various fields of Smart Systems Integration over a 350 sqm exhibition area. High-profile keynote speakers from the European Commission, EADS, NXP Semiconductors, Siemens, FIAT and Gemalto gave papers on

developments and fields of application of smart systems. The next event will take place in April 2008 in Barcelona.

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