

FABRICATION

A NEW MANUFACTURING FACILITY



Crolles facility

TRONIC'S unveils its new MEMS production site

TRONIC'S Microsystems has just announced it is now in possession of a brand new MEMS production facility in Crolles (France), near the previous Grenoble site.

The 650 sqm production and test plant, built in a 1250 sqm existing building, is to be

fully dedicated to the production of high-end MEMS based custom components.

"Timing and conditions are perfect now for this strategic investment. It will make TRONIC'S Microsystems a most competitive entity for customized MEMS manufacturing, open and ready for new products and customers." said CEO, Peter Pfluger.

Increasing demand from TRONIC'S customers for high performance MEMS products led to the decision to build this new production facility.

The investment also strategically ensues from the receipt of the remaining 5.25M€ (out of the 10.5M€) resulting from the second round of fund raising made by TRONIC'S Microsystems in July 2001.

Currently, the company is rapidly stepping up production of high performance customized inertial sensors based on specialized thick Silicon-On-Insulator (SOI) Surface and High Aspect Ratio Micromachining processes.

TRONIC'S Microsystems has started installing the 4- and 6- inch compatible equipments already purchased.

The 400 sqm clean room is then expected to start volume production by year end. Its ultimate production capacity is 10,000 wafer per year.

With its new MEMS production facility, TRONIC'S Microsystems reinforces its position and is, more than ever, ready to answer any custom demand.

NEW CONTACT DETAILS

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A YOUNG COMPANY, ALWAYS LEARNING



Peter Pfluger, CEO

Peter Pfluger joined TRONIC'S Microsystems a few months ago, as Chief Executive Officer (CEO). His industrial background is strategic for the development of a young company, operating in the field of new technologies. He gives us his point of view on TRONIC'S future.

1- You have been managing TRONIC'S for 6 months . What are your feelings after this period ?

First of all, I want to underline the evident progress made by TRONIC'S concerning business development with our major customers. We have confirmation of their increasing needs in the short and medium term. Then, I am particularly happy to lead a highly motivated team, hard working, with a strong will and a high degree of initiative. Thanks to assets from the 2001 second round of funding, our shareholders allowed us to launch the project of our new manufacturing facility in Crolles; this project is now well advanced. I am also very happy to have been made so welcomed by the company founders.

2- Although the international economic environment is tough, particularly for many MEMS producers, TRONIC'S has just invested in new facility in Crolles. Could you comment ?

There is a market for high performance MEMS components. That means that business is always possible, even in times of difficulties. And, somebody has to take it, so why not us? Moreover, it can be good policy to go against cyclic events. Being more daring now will put us well into the starting blocks when the economy speeds up.

3- How do you foresee TRONIC'S future in the next 2 years ?

In the coming 12 months, our first priority is to have our new industrial plant to be operational. That means the best setting up of our production unit, qualification of equipments and methods, to be followed by the transfer under the best conditions of our production and development activities.

For the next year, we will firstly focus, on pursuing and exploiting present efforts and secondly, on concluding new businesses to develop our markets and to achieve break even during 2005.

4- In your opinion, what are TRONIC'S strengths and weaknesses ?

TRONIC'S is a young company, which is both its strength and its weakness but above all its potential. Our technologies are new, our teams are mainly young, and the MEMS market - especially for SOI based components - remains recent, even within customer applications there is a lot of innovation. Altogether, there is still room for us to learn a lot. TRONIC'S has all the ingredients for success :

- a modern and promising technology,
- a strong team heading towards maturity,
- a well balanced industrial tool.

These represent the true strength of the company.

NEW PROJECT

WIDE BAND RF MEMS

TRONIC'S Microsystems who was already working in the field of RF MEMS is now one of the 6 partners of the European research project called "Wide-RF".

TRONIC'S Microsystems has been developing, since 1999, a metal surface micromachining technology for tunable capacitors and integrated coils based RF MEMS devices, for a leading telecom O.E.M. The company

is now involved in a three-year European research project called "Wide RF", on microsystems architecture, working in frequencies between 0.8 and 10 GHz.

The new project associates Thales Airborne Systems (FR), EPFL (CH), HELIC (GR), University of Cambridge (UK), INPG/LPCS (FR) and TRONIC'S Microsystems. It aims at developing design and production technology for RF MEMS devices such as RF switches, tunable capacitors and inductors.

This project includes modeling and simulation tools along with reliability stu-

dies, and will benefit from TRONIC'S Microsystems wafer level packaging know-how. It will solve the challenging issues of RF MEMS packaging such as, for example, limiting parasitic capacitances.

As a final result, the program intends to serve various demanding areas such as aerospace and satellite electronics (smart antennas) or cellular telephony and WLAN.

With this new partnership, TRONIC'S Microsystems appears as a major European actor in the field of wide band RF MEMS.

PACKAGING SOLUTIONS AT TRONIC'S

One of the highest challenges in MEMS remains the packaging. TRONIC'S Microsystems produces custom packaged sensors and optical MEMS.

Vacuum packaging

Several MEMS devices with extreme performances (high sensitivity or low noise devices, high Q factor resonators, ...) require to be vacuum packaged.

Thus, TRONIC'S Microsystems produces a custom vacuum packaged inertial sensor with high Q factor.

The silicon die is mounted in a ceramic type LCC housing which is then vacuum sealed by entectic bonding with a leak free mechanism.

The vacuum level, correlated with the mechanical resonance coefficient, is ensured better than 0.1 mbar and can be lower than 1 mTorr with a very high stability over time.

Wafer level packaging:

- Inertial sensors

Wafer level packaging techniques bring two key advantages:

- batch processing,
- protection of microstructures during dicing.

TRONIC'S Microsystems has led the way in this field by producing wafer level Chip Size Packaged accelerometers since 1999.

This packaging technique can be used for different types of inertial sensors and brings key selling points:

- higher miniaturisation,
- vertical or horizontal SMT mounting with solder,
- reworkability.



Wafer level packaged accelerometer



Wafer level packaged 1x40 micro-mirrors array

- Optical MEMS

TRONIC'S Microsystems has also been developing an optical wafer level packaging, dedicated to optical micro-mirrors arrays.

This packaging features :

- a glass cap treated with an anti-reflecting coating,
- a low temperature bonding process to protect the mirror coating,
- an access to the command electrodes of the mirrors through wire bonding.

Using those solutions, TRONIC'S Microsystems delivers to its clients, fully packaged and tested custom MEMS devices.

MULTI-PROJECT WAFER SERVICE

SENSORS AND ACTUATORS ON SOI

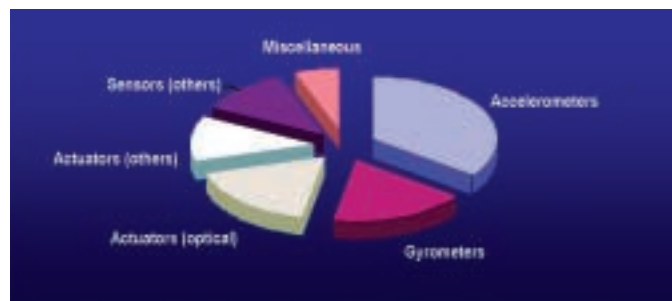
The MEMSOI MPW service is now entering its 4th year of activity. The perfect time for analysing its end use areas.

The product mix of structures tested on MPW shows a wide spectrum of sensors and actuators applications.

- For sensors, the predominance of high performance

capacitive inertial sensors (accelerometers, gyrometers) is noticeable.

- For actuators, the electrostatic optical actuators represents the most popular design type.



MPW product mix (1999-2003)

For next runs, see www.tronics-mst.com/memsoi.html



About one fourth of these trials have presently led to a custom MEMS development.

CONFERENCES AND FAIRS

Come and visit us at the following event

* **MINATEC** conference 2003, Grenoble (F) Alpes Congrès September 22-26 Visit our booth N° 19