Omron's MEMS Foundry Service

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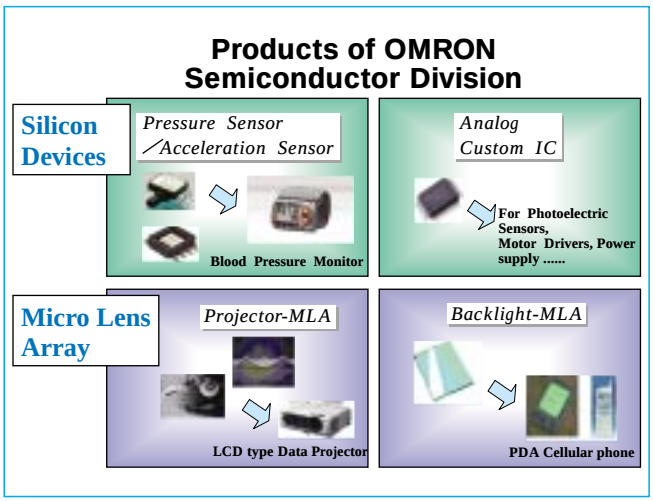
1. Outline

The Semiconductor Division and MEMS Division at the Omron Corporation ECB Company officially began a MEMS foundry service in 2001 due to the rising demand for the MEMS foundry. In 1988 Omron began producing bipolar ICs and in 1999 began MEMS research at the Central R&D Laboratory in Tsukuba, Ibaraki Prefecture. Through achievements made in this research, Omron began mass-producing ultrasmall capacitance-type pressure sensors and accelerometers at its Minakuchi factory in Shiga Prefecture in 1996. In 1998 Omron added a microlens array project that combines the use of semiconductor micromachining and electroforming, and has been mass-producing microlens arrays for LCD type data projectors and LCD backlights for cellular phones and PDAs. Omron has amassed a production of more than 18 million ultrasmall capacitance sensors and more than 50 million microlens-related devices.

In addition to the mass-produced products described above, Omron has undertaken the development of numerous MEMS devices when participating in the national Micromachine Project in the 1990s. These MEMS devices include optical scanners, micromachine relays (MMR) currently under development, 3-axis accelerometers, and flow sensors that are now being mass-produced.

With the increasing need for a MEMS foundry, Omron has been encouraged to develop such a foundry by many people seeking the participation of a manufacturer with mass-production experience. Accordingly, we have officially established a MEMS foundry that is founded on such strengths as our technological know-how, production experience, and infrastructure.



2. Features of Omron's foundry service

Processes provided by the foundry service focus on bulk micromachining techniques such as anodic bonding (including bonding in vacuum) and electrochemical etchstop (ECE) that are base technologies for mass-produced sensors. The foundry performs on commission such silicon processes as thin-film formation, wet and dry etching, impurity layer formation, and electrode formation; and such glass wafer processes as metal formation on special lines and etching. The foundry also accepts commissions for processes based on the microlens array technology, including an electroforming technique using substrates produced through semiconductor micromachining, and ultraprecision formation using photopolymerization (a curing method using ultraviolet rays). The electroforming foundry has garnered very high praise from the market for its production of substrates that can be formed in any shape by the foundry's unique methods and for electroforming in its clean room. The merging of electroforming or machining techniques with semiconductor fabricating techniques has expanded the possibilities not only in the field of sensors, but also for a variety of devices and structures, such as labs-on-a-chip and microneedles.

Omron accepts orders ranging from a small number of prototypes to mass-production and can delivery wafers or chips or only perform partial processing, depending on the user's wishes.

Procduction is carried out at our Minakuchi factory in Shiga Prefecture using production lines and a clean room for bipolar ICs and a clean room dedicated to MEMS. Another of our strengths lies in our foundry members, who have a wealth of experience from R&D to mass-production.

3. Conclusion

Last year we combined the two laboratories at Tsukuba City and Nagaokakyo City in Kyoto and established a new base for MEMS research in the Kyoto-Osaka-Nara area. At this base, we are also conducting research on RF switch manufacturing techniques in the "MEMS project" adopted by NEDO.

In addition to sophisticating more about the techniques accumulated thus far, we hope to introduce new technologies and continue to expand the foundry service.

For further details, refer to the URL:
http://www.omron.co.jp/ecb/products/sc/index.html