

# ROHM Co., Ltd.

## 1. Company Profile

ROHM Co., Ltd. is a manufacturer of semiconductor devices and electronic components and is involved in the development of systems in a wide variety of fields, including consumer electronics, mobile phones and communication devices, and automotive devices. While its headquarters are in Kyoto, ROHM utilizes a development and sales network that has expanded globally to provide LSIs and discrete semiconductor products with superior quality and reliability.

Moore's Law suggests that technological innovation in semiconductors will come through refinements in manufacturing processes. ROHM, on the other hand, is pursuing improvements in performance through new concepts, as reflected in its motto "More than Moore." We are meeting new demands in the industry by exploring diverse technological innovation that transcends the traditional measuring stick of "refinement," while developing or integrating element technologies in a wide range of fields, such as new materials, MEMS, biotechnology, and optical technology.

Among its efforts in the field of MEMS, ROHM manufactures high-performance MEMS accelerometers and high-performance products suitable for sensor networks employing MEMS devices. The latter is achieved through the utilization of our core technologies, including low power consumption, miniature packaging, digital-analog mixed-signal ICs, and wireless communications. We've also completed the development of a microvolume blood analyzing chip, a concept realized by integrating biotechnology with MEMS.

## 2. Activities in Bio-MEMS

Nearly a decade has passed since ROHM began R&D in biotechnology. Our R&D efforts have been oriented primarily toward self care products. During this time, we have been developing  $\mu$ TAS (micro total analysis system) technology as a core technology. Owing to the decrease in population in recent years coupled with a rapid decline in birthrate and an aging population, we anticipate a surge in users of health and welfare, medical care, and nursing services. Indeed, the age of home care and point of care testing (POCT) has arrived.

The field of biotechnology, of which we have only just begun to scratch the surface in our R&D activities, is currently showing promise as a candidate for company-wide development under one of our three concepts of business expansion aimed at the next fifty years: health and medical care, safety and security, and the

environment. Based on our concept of "More than Moore," we are now working toward the fusion of biotechnology with semiconductor and optical technology, which we have gained over the years, and are developing compact medical and bio systems.

As an example of our progress in biotechnology, ROHM has developed a POCT product called Banalyst<sup>®</sup>, a microvolume blood testing system employing a  $\mu$ TAS chip. This system can perform tests on just a drop of blood and in less than ten minutes, outperforming large analyzing equipment. The entire test reaction is made possible by constructing a micro reaction space in the biochip using  $\mu$ TAS technology and performing flow control for a reagent that has been pre-encapsulated in the chip.

Compact systems using  $\mu$ TAS are expected to flourish in a variety of medical settings for tasks that were previously unheard of, such as bedside examinations in clinics and examinations for health care in remote areas.

The microvolume blood testing system Banalyst employing  $\mu$ TAS



The microvolume blood testing system Banalyst employing  $\mu$ TAS

## 3. Conclusion

In addition to bio-MEMS devices, we will be working on technical development of MEMS devices for application in sensor networks and energy harvesting systems. To this end, we believe it necessary to engage in strategic government-industry-academy collaboration in order to combine our fields of specialty. We hope that such close collaboration and the exchange of ideas will lead to rapid development of novel products.