

## SCIENTIFIC MEDIA RELEASE

### **A\*STAR IME AND CUBIC MICRO DEVELOP LOW POWER HIGH PERFORMANCE RF TRANSCEIVER FOR ENHANCED WIRELESS SMART ENERGY MANAGEMENT AND REMOTE INDUSTRIAL MONITORING**

1. Singapore, 25 February 2014 — A\*STAR Institute of Microelectronics (IME) and Cubic Micro today announce that they have developed and demonstrated a 400 MHz radio frequency (RF) transceiver with the highest power efficiency and leading performance reported to deliver high quality signals over industry's widest coverage in wireless sensor network applications. The transceiver is integrated with a highly configurable baseband, which allows users to customize transceiver performance for specific applications ranging from wireless smart energy management and security control in homes and buildings to long-range remote industrial monitoring.
2. To achieve low power consumption in RF transceiver, performance is typically sacrificed, resulting in degradations of sensitivity, channel selectivity and interference immunity during the wireless signal communication process.
3. To address the performance and power consumption dilemma, the IME team has employed a low-power low-noise linear RF chain and a 75-dB-dynamic-range band-pass analogue-to-digital converter (ADC) so that channel filtering is conducted in the low-power digital circuits. This strategy cuts energy consumption by up to 55% while providing unprecedented wireless communication range that supports highest reported sensitivity along with excellent selectivity compared to commercially available transceiver chips. These features translate into fewer sensor nodes to achieve similar network coverage in a wireless sensor network, further reducing costs and power consumption.

The design is amenable to mass production and is compatible with both Japanese standards<sup>1</sup>, while also meeting the emission limits of Europe and US.

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<sup>1</sup> Japanese standards of ARIB STD-T67 and T-30 stipulate specifications of low-power long-range narrowband radios for wireless sensor network applications.

4. “IME’s commitment to continually demonstrate strong R&D capabilities in CMOS RF design has attracted partners who look forward to developing next-generation smart energy metering solutions,” said Professor Dim-Lee Kwong, Executive Director of IME. “We look forward to strengthening customer adoption to benefit the community with a wider range of innovative applications.”
5. “We are glad to have developed the lowest power and high performance RFIC in Asia together with IME,” said Mr Yutaka Kumagai, Managing Director of Cubic Micro. “This kind of joint developments will be needed for high diversity business environment, and we believe IME will be one of the best technology partners in the area of wireless solution to create new product and technologies.”

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### **About Institute of Microelectronics (IME)**

The Institute of Microelectronics (IME) is a research institute of the Science and Engineering Research Council of the Agency for Science, Technology and Research (A\*STAR). Positioned to bridge the R&D between academia and industry, IME's mission is to add value to Singapore's semiconductor industry by developing strategic competencies, innovative technologies and intellectual property; enabling enterprises to be technologically competitive; and cultivating a technology talent pool to inject new knowledge to the industry. Its key research areas are in integrated circuits design, advanced packaging, bioelectronics and medical devices, MEMS, nanoelectronics, and photonics. For more information about IME, please visit <http://www.ime.a-star.edu.sg>.

### **About the Agency for Science, Technology and Research (A\*STAR)**

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector agency that fosters world-class scientific research and talent to drive economic growth and transform Singapore into a vibrant knowledge-based and innovation driven economy.

In line with its mission-oriented mandate, A\*STAR spearheads research and development in fields that are essential to growing Singapore’s manufacturing sector and catalysing new growth industries. A\*STAR supports these economic clusters by providing intellectual, human and industrial capital to its partners in industry.

A\*STAR oversees 18 biomedical sciences and physical sciences and engineering research entities, located in Biopolis and Fusionopolis, as well as their vicinity. These

two R&D hubs house a bustling and diverse community of local and international research scientists and engineers from A\*STAR's research entities as well as a growing number of corporate laboratories.

Please visit [www.a-star.edu.sg](http://www.a-star.edu.sg)

### **About Cubic Micro**

Cubic Micro Inc. is a design support and product solution company in Japan focus on wireless technology area. The mission of Cubic is "to contribute to the ECO & Harmonic human society through the Development of New Business and Technology together with Strategic Partners in the area of Semiconductor & its Application Market". Headquarter is located at Shin-Yokohama in Japan and its Singapore branch is Cubic Micro Design Pte Ltd.

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