



## **PRESS RELEASE**

### **IME Develops Advanced RF CMOS Chip to Enable Low Cost UHF RFID Reader/Writer Modules**

**Singapore, 29 January 2007** – Following its success in developing the world's first passive read/write RFID (Radio Frequency Identification) tag with on-chip antenna, the Institute of Microelectronics (IME) has once again broken new grounds in its development of RFID solutions with the demonstration of a silicon chip that enables low cost UHF (Ultra High Frequency) RFID reader/writer modules.

IME is amongst the world's leaders in RFID solutions and now offers an advanced multi-standard reader chip based on RF CMOS (Radio Frequency Complementary Metal-Oxide Semiconductor) technology. It has also demonstrated a working module with commercially available UHF RFID tags together with a local industry partner SmartID. IME's reader IC chip has several attractive features making it suitable for world-wide adoption as it is useable for multiple RFID standards and is compatible with the requirements of different countries.

In recent years, RFID systems are gaining popularity and are being used in numerous applications. Examples include the use of RFID in supply chain management to help monitor and control inventory supplies, identification process in the pharmaceutical industry to ensure that the products are authentic and tracking the movement of items such as books in the library or apparels in a retail outlet.

In these cases, fixed portal readers are used to check incoming boxes with RFID tags and take stock of purchased items at checkout counters. Handheld readers are used to take inventory of RFID tagged items in the store room and display shelves.

Despite its popularity, RFID systems are not yet as widely adopted due to its high costs. At present, the conventional reader modules cost a few thousand dollars, are about 6 x 6 inches in size, weigh 1-2 kilograms, consume about 10 watts of power and are built using discrete components.

To address these issues, researchers at IME have integrated all the discrete components required for the radio frequency section of the reader module onto a single piece of silicon. This has resulted in the development of a highly integrated 0.18um RF CMOS reader IC (Integrated Circuit) that is able to

bring down the costs of each RFID reader module to below US\$100. The bulky conventional reader module is also reduced to a small, name card size module weighing less than 100 grams and consuming less than a watt of power. This reader IC is programmable from 860–960 MHz band, which allows coverage in Asia, Europe and the United States. A patent has been filed for this RF CMOS reader.

“As Singapore shapes the RFID industry, Exploit Technologies is a key driver in fostering its adoption as the National RFID Centre opens a window for A\*STAR’s researchers and industry partners to trial and deploy the technology,” said Mr Boon Swan Foo, Executive Chairman, Exploit Technologies, the strategic marketing and commercialisation arm of A\*STAR. “Exploit Technologies is instrumental in fostering and funding the application development of IME’s RF CMOS chip through its S\$10 million RFID Proof-of-Concept (POC) initiative. The National RFID Centre will help to further accelerate the adoption of the RF CMOS chip by identifying potential commercial partners to trial and apply the technology.”

Said Professor Dim-Lee Kwong, Executive Director of IME, “Singapore has placed strong emphasis on RFID technology and has been a leading adopter of it. IME has been playing a vital role to apply its technological knowledge in bringing out innovative and low cost RFID solutions – first we did it with the tags with external and internal antennas and now we have delivered the highly integrated and low cost reader IC to complete our offerings.”

Together with its industry partner SmartID Technology Pte Ltd, IME has demonstrated a module with commercially available UHF RFID tags. IME’s chip is also being sampled to selected customers. SmartID is a leading player in providing UHF RFID reader solutions with deployments in logistics supply chain management and intelligent access control.

Commented Mr Dan Lee, Business Development Director of SmartID Technology Pte Ltd, “The initial evaluation of the IME UHF reader chip yielded excellent results and we are very pleased with its performance. With the highly integrated circuitry and small chip size, we believe the UHF reader pricing will hit mass market adoption level in the year 2007. This silicon chip will help in the proliferation of RFID technology by reducing the total solution costs.”

With the adoption of an ISO standard in UHF RFID in June 2006, the market is poised for an accelerated growth. According to market research, the UHF reader ICs market is expected to grow from 5 million units in 2007 to 13 million units in 2009, with UHF reader revenue increasing from US\$600 million to US\$1 billion, exhibiting a CAGR of 130%.

## **Notes to the Editor**

Radio Frequency Identification, or RFID, is a technology that uses radio frequency communication to automatically identify, track and manage objects, people or animals. It works by using two or more devices - a reader and tag. Readers are able to "recognise" tags through the transmission of radio waves.

UHF RFID operates in 860-960 MHz bandwidth and is ideally targeted towards supply chain and logistics applications. UHF, with its longer read range compared to HF technology, is considered to be better suited for reading pallets and cases from portal or conveyor antennas.

RFID has been touted as the next big wave that will revolutionise how businesses are conducted today.

A\*STAR, through its commercialisation arm, Exploit Technologies Pte Ltd, has launched a S\$10 million RFID Proof-of-Concept (POC) initiative in 2005 to help companies and potential end users develop RFID solutions and support users' experiments to identify possibilities with the technology. It is now timely for the Singapore industries to make the strategic move from pilot trials to full RFID.

In September 2006, the National RFID Centre was opened to help companies and users exploit the full potential of RFID technology. The Centre is an inter-agency collaboration among A\*STAR, the Economic Development Board (EDB), the Infocomm Development Authority of Singapore (IDA) and the Standards, Productivity and Innovation Board (SPRING Singapore).

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

The Institute of Microelectronics (IME) is a research institute of A\*STAR. Positioned to bridge the R&D between academia and industry, IME's mission is to increase value-add to the electronics industry in Singapore by engaging in relevant R&D in strategic fields of microelectronics; supporting and partnering the electronics industry; and developing skilled R&D personnel. Its key research areas are in integrated circuits and systems; semiconductor process technologies and microsystems, modules and components.

(website: [www.ime.a-star.edu.sg](http://www.ime.a-star.edu.sg))

### **About Exploit Technologies Pte Ltd**

Exploit Technologies is the marketing and commercialisation arm of the Agency for Science, Technology and Research (A\*STAR). Its charter is to identify, protect and exploit promising intellectual property (IP) created by A\*STAR's research institutes. This includes facilitating the IP management process (ie the protection of inventions through patents and copyrights, etc), analysing the strength of our IP and the market that they could serve, and working with companies to commercialise the technologies. For more information, please visit <http://www.exploit-tech.com>

### **About Smart ID Technology Pte Ltd**

Smart ID Technology Pte Ltd was founded in June 2003. Its primary ambition and focus is to be a leading provider of wireless solutions. Smart ID is today delivering creative and competitive solutions for RFID and WiFi applications.

(website: <http://www.smartid.com.sg>)

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