**Press release**

# Unisantis and Institute of Microelectronics to Jointly Develop Breakthrough Three-Dimensional Transistor in Singapore

World-class Japanese technologist Fujio Masuoka to spearhead team for developing Surrounding Gate Transistor

**Singapore, 4 December 2007 –** A breakthrough transistor – the fundamental building block of integrated circuit (IC) chips used in electronic devices – that promises a significant increase in computing power will be engineered in Singapore.

Leading technology research and development company Unisantis Electronics (Japan) Ltd and the Institute of Microelectronics (IME) today announced a collaborative research agreement to develop the world's first three-dimensional transistor locally.

A team of researchers will be assembled in Singapore to develop the device, known as the Surrounding Gate Transistor (SGT). The agreement represents a world coup for Singapore that puts the country firmly on the global stage for cutting-edge semiconductor research.

The team will be headed by Unisantis' chief technology officer Fujio Masuoka. A world-renowned scientist, Prof Masuoka invented the flash memory storage format that allows handheld gadgets like digital cameras and MP3 players to retain stored information even after they are switched off. He has also been involved in the research and development into numerous types of computing memory devices, including programmable read-only memory and random access memory.

According to Prof Masuoka, the SGT comprises a vertical silicon pillar surrounded by memory cells, electrical contacts and other components. Such a design methodology greatly reduces the distance that electrons – which transmit information-bearing electrical signals – must travel within the SGT.

Next-generation IC chips fabricated with the SGT could be up to 10 times faster than existing chips built using conventional, two dimensional transistors with horizontally-arranged components. In addition, SGT-based chips could generate less heat and cost less to produce compared to existing ones.

"The SGT also allows further improvements in silicon-based semiconductors, in terms of transistor size and processing speed, for at least 30 more years before the theoretical limits are reached. Such improvements are necessary for new-generation IC chips to meet the computing power demanded by IT products and computing networks of ever-increasing functionality and complexity," said Prof Masuoka, who has been awarded the prestigious 2007 Medal with Purple Ribbon by Emperor Akihito of Japan and the 2005 Innovation Award by The Economist.

With the Unisantis-IME collaboration, Prof Masuoka – who has been working on the SGT for 20 years – will bring his considerable expertise in semiconductor electronics and related fields to Singapore.

He will spearhead the research and development team, planned to comprise more than 30 professionals, throughout the project. Both organisations envision the team to comprise academics, engineers and scientists from countries including Singapore, China, Korea, Malaysia and Taiwan.

IME will provide its expertise in silicon nanoelectronics research and complementary metal oxide semiconductor (CMOS) processing, as well as state-of-the-art laboratory facilities at its premises in Science Park II for prototype development.

The agreement will be in place for 24 months beginning immediately, and may be extended if necessary.

“We are delighted to have signed the collaborative research agreement with IME,” said Mounir Barakat, chief executive of the Unisantis Group. “Singapore offers tremendous advantages by way of its established R&D culture and pro-investment business climate. This collaboration allows Unisantis to take the development of the SGT to the next level by leveraging on IME's expertise and facilities to develop and fabricate the device,” he added.

Commented Prof Kwong Dim-Lee, Executive Director of IME, "IME has been collaborating with many industry partners in various fields such as silicon photonics, bio-electronics, micro-electro-mechanical systems, advanced electronics packaging and radio frequency circuit design. Apart from developing the technologies and solutions needed by our partners, IME also facilitates a seamless transfer of the technology to the local industry for mass production. The collaboration with Unisantis will enable IME to utilise our expertise in silicon nanoelectronics and our state-of-the-art wafer processing facilities to realise the SGT."

Interested parties may visit www.unisantis-el.jp or www.ime.a-star.edu.sg for more information.

###

**Press contacts**
Mileage Communications (for Unisantis)
Steven Ng / Alvin Tan
Tel: 6222-1678
Email: steven@mileage.com.sg / alvin@mileage.com.sg

Institute of Microelectronics
Jesmine Ong
DID: 6770 5375
Email: onggk@ime.a-star.edu.sg