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Immediate Release

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Photonic CDCs from XNRI-IME collaboration to stabilize high speed, long distance communication

Bussan Nanotech Research Institute - Press Release for OFC 2005, 6-11 March 2005, Anaheim, California

A collaborative research between Japan's Bussan Nanotech Research Institute Inc (XNRI) and Singapore's Institute of Microelectronics (IME) has yielded its first Chromatic Dispersion Compensator (CDC) prototype device. Initial testing of the prototype in Japan conducted last week has been promising, and the device will be fine-tuned as proof-of-concept for commercial production in the next phase of the collaboration, expected to commence in the second quarter of 2005.

The collaboration, started in September 2004, aims at enabling stable high speed and long distance communication by developing technologies that will control signal distortion caused by wavelength dispersion occurring in optical fibres.

Optical communication networks currently operate at transmission speeds of up to 10 Gbps. In the near future they are expected to deliver data transmission speeds in excess of 40 Gbps that will dramatically reduce the distance of transmission without the need for dispersion compensation from 30 km to 2 km. A low-cost yet efficient solution to improve the reliability of the transmission has become a necessity.

XNRI's solution is to create a compact photonic crystal-based CDC on silicon-based wafers. This solution will reduce the power penalty of high speed optical networks down to 3 dB and offer significant cost savings over current dispersion compensators. The device fabrication and wafer dicing were carried out at IME's advanced 8-inch silicon wafer processing and packaging facility, where IME researchers used 248 nm deep ultraviolet lithography to produce the photonic crystal structures for the CDC devices. IME is one of the few organizations in the world with such capabilities.

The fabrication process uses silicon-on-Insulator wafers and is fully CMOS compatible, paving the way for XNRI to offer a "plug and play" solution while ensuring low cost and high yield in its production. The first prototypes delivered to Japan in February 2005 withstood XNRI's stringent characterization tests. The results were also verified with computer simulation results, exhibiting electro-optic tuning of chromatic dispersion. The first commercial product is expected to reach the market by the end of 2007.

Although the market for such optical component is only just emerging, the demand will quickly accelerate as the transmission rates increase. In addition, the mandatory and higher usage of the chromatic dispersion compensator in network systems that deploy DWDM is expected to fuel the market growth of this device. According to industry analysts, global demand for chromatic dispersion compensating devices is estimated to be US\$47 million in 2007, growing from US\$29 million in 2004 (Source: RHK, 2004).

XNRI is a wholly owned subsidiary of Mitsui & Co Ltd, while IME is a member of the Singapore Government's Agency for Science, Technology and Research (A*STAR). XNRI's mission is to develop technologies, working with internationally acclaimed research institutions to bring these technologies to mass production and the world market.

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About Bussan Nanotech Research Institute (XNRI)

XNRI was set up in 2001 as the nanotechnology R&D arm of Mitsui & Co. Ltd. It comprises of three nanotechnology research divisions – Bio NanoTech Research Institute (BNRI, focusing on nano-porous materials), Carbon Nanotech Research Institute (CNRI, focusing on fullerenes and carbon nanotubes), Device Nanotech Research Institute (DNRI, focusing on MEMS, nanoelectronic devices, and Biotechnology and related materials), and Bussan IP Inc (INRI) the sister company that focuses on information, business strategy, and intellectual property. XNRI understands the interdisciplinary nature of nanotechnology, and directs its efforts into research areas related to the environment, energy and medicine. It was founded to produce quick results through synergistic alliances to create new global markets utilizing Mitsui's comprehensive expertise.

For more information, please visit: **www.xnri.com**

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

A*STAR's mission is to foster world-class scientific research and talent for a vibrant knowledge-based Singapore. The Agency comprises the Biomedical Research Council (BMRC), the Science and Engineering Research Council (SERC), the A*STAR Graduate Academy (A*GA), the Corporate Planning and Administration Division (CPAD) and a commercialisation arm, Exploit Technologies Pte Ltd (ETPL).

The Science and Engineering Research Council (SERC) funds and oversee 7 public research institutes in areas such as chemical sciences, materials, high performance computing, information technology and communications, manufacturing technology, microelectronics and data storage.

For more information, please visit: www.a-star.edu.sg

About the Institute of Microelectronics (IME)

The Institute of Microelectronics (IME) is a member 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 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.

For more information, please visit: www.ime.a-star.edu.sg