



**Media Release**  
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## **NICTA develops a world first in semiconductor technology for the wireless home and office of the future**

The world's first transceiver integrated on a single chip that operates at 60GHz on the CMOS (complementary metal-oxide-semiconductor) process, the most common semiconductor technology, was announced today by NICTA, Australia's Information and Communications Technology (ICT) Research Centre of Excellence.

The development will enable the truly wireless office and home of the future. As the integrated transceiver developed by NICTA is extremely small, it can be embedded into devices. The breakthrough will mean the networking of office and home equipment - without wires - will finally become a reality.

Researchers from NICTA's Gigabit Wireless Project, which is based out of NICTA's Victoria Research Laboratory, are the first in the world to have developed an integrated transceiver, a complete transmitter and receiver, on a single chip at 60GHz on CMOS.

This technology breakthrough will enable the wireless transfer of audio and video data at up to 5 gigabits per second, ten times the current maximum wireless transfer rate, at one-tenth the cost.

"Our team, which includes 10 PhD students from the University of Melbourne, has overcome some significant challenges in developing this breakthrough technology," NICTA Chief Executive Officer Dr David Skellern said. "Developing very high frequency radio components in a standard CMOS process and then integrating those components on a single chip has posed challenges in dealing with the inherent limitations of that process for radio circuits.

"Now that NICTA researchers have successfully addressed these challenges, the ICT industry will soon have access to low cost, low power and high broadband chips that will be vital in enabling the digital economy of the future."

NICTA Gigabit Wireless Project Leader Professor Stan Skafidas said the design and development of the world's first 60GHz transceiver integrated on a single CMOS was the result of a three-year research effort.

NICTA's research involved a close collaboration with leaders in the global semiconductor industry. The technology was developed using the IBM 130nm RF CMOS process.

"Our collaborators IBM, Synopsys, Cadence, Anritsu, Agilent, Ansoft and SUSS MicroTec have been critical to our success and we are grateful to have had their valuable support," Professor Skafidas said. "Our innovative design methodology and access to leading design, test and measurement, and fabrication technology has allowed us to deliver this world-first success."

NICTA researchers chose to develop this technology in the 57-64GHz unlicensed frequency band as the millimetre-wave range of the spectrum makes possible high component on-chip integration as well as allowing for the integration of very small high gain arrays.

“The availability of 7GHz of spectrum results in very high data rates, up to 5 gigabits per second to users within an indoor environment, usually within a range of 10 metres,” Professor Skafidas said.

NICTA Chief Technology Officer, Embedded Systems, Dr Chris Nicol said the availability of a single chip, low cost, very high speed wireless technology will transform the home entertainment industry. “For example, consumers will be able to download a high definition DVD onto their personal digital assistants at a public kiosk in seconds, take it home and play it directly onto their high definition TV.”

**About NICTA**

National ICT Australia Limited (NICTA) is a national research institute with a charter to build Australia's pre-eminent Centre of Excellence for information and communications technology (ICT). NICTA is building capabilities in ICT research, research training and commercialisation in the ICT sector for the generation of national benefit.

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NICTA was established and is supported by its members: The Australian Capital Territory Government; The Australian National University; NSW Department of State and Regional Development; and The University of New South Wales. NICTA is also supported by its partners: the University of Sydney; University of Melbourne; the Victorian Government; the Queensland Government; Griffith University; Queensland University of Technology; and The University of Queensland.

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