

Sesame seed-sized antenna increases WIFI speed by 200 times

August 28 2012

Researchers from A*STAR's Institute of Microelectronics (IME) have developed the first compact high performance silicon-based cavity-backed slot (CBS) antenna that operates at 135 GHz. The antenna demonstrated a 30 times stronger signal transmission over on-chip antennas at 135 GHz. At just 1.6mm x 1.2mm, approximately the size of a sesame seed, it is the smallest silicon-based CBS antenna reported to date for ready integration with active circuits.

IME's innovation will help realise a wireless communication system with very small form factor and almost two-thirds cheaper than a conventional CBS antenna. The antenna, in combination with other millimetre-wave building blocks, can support wireless speed of 20 Gbps—more than 200 times faster than present day Wi-Fi, to allow ultra fast point-to-point access to rich media content, relevant to online learning and entertainment.

On the research breakthrough, Dr Hu Sanming, a key researcher from IME leading the antenna project, said, "The novel use of polymer filling enables >70% antenna size shrinkage and a record high gain of 5.68 dBi at 135 GHz. By filling the antenna cavity with polymer instead of air, we can achieve a flat surface for subsequent processing by standard technology that is amenable to mass production."

"The team has also designed a three-dimensional (3D) architecture to integrate the antenna with active circuits to form a fully integrated wireless millimetre-wave system-in-package solution with high

performance, reduced footprint and low [electromagnetic interference](#)," commented Dr Je Minkyu, Principal Investigator of the [Integrated Circuits](#) and Systems Laboratory at IME.

Professor Dim-Lee Kwong, Executive Director of IME, said, "IME's silicon-based 135 GHz integrative [antenna](#) technology and the proposed 3D architecture have immense commercial potential as it combines form with function that can be realised with standard mass production infrastructure. These salient features make our technology extremely attractive to product developers who are looking to capture emerging markets in millimetre-wave applications."

Provided by Agency for Science, Technology and Research (A*STAR), Singapore

Citation: Sesame seed-sized antenna increases WIFI speed by 200 times (2012, August 28) retrieved 26 April 2024 from <https://phys.org/news/2012-08-sesame-seed-sized-antenna-wifi.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.