

Japan collab transmits record data speeds on terahertz waves

November 25 2011, by Nancy Owano

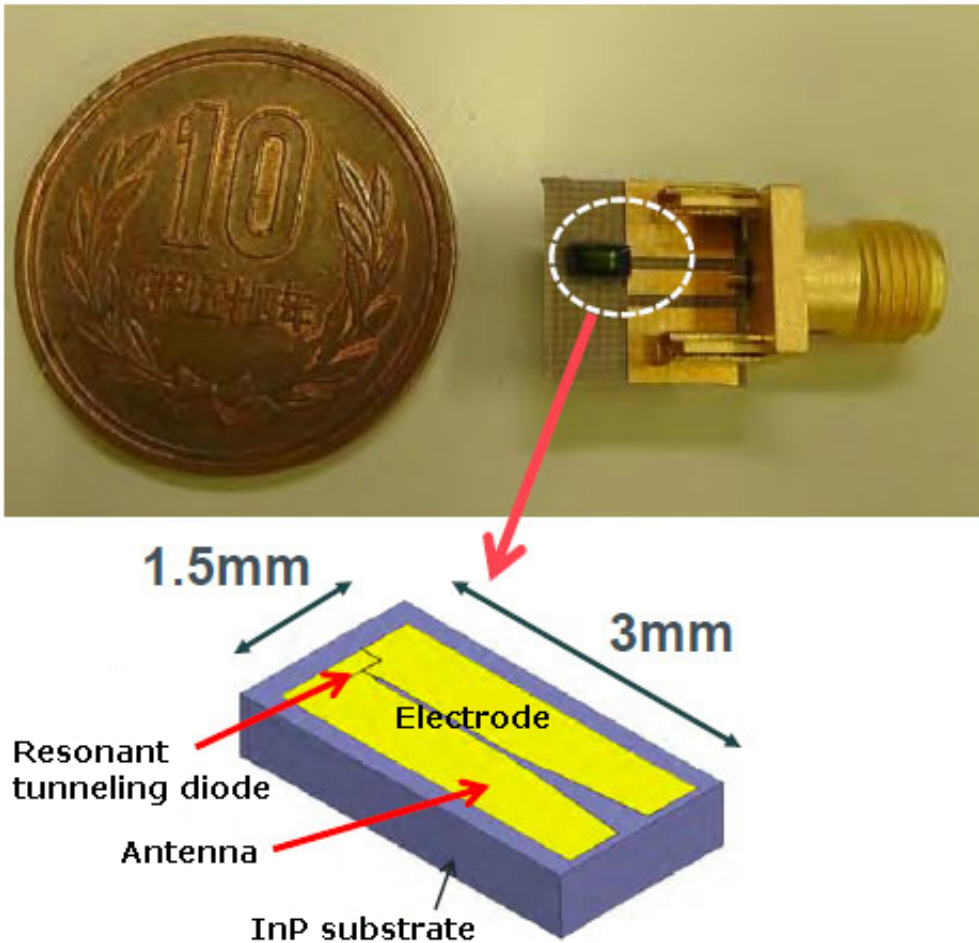


Image credit: Rohm / Osaka University

(PhysOrg.com) -- Researchers from Japan-based semiconductor manufacturer Rohm, together with a team from Osaka University, have

come up with a chip that, in experiments, has achieved a wireless data transmission speed of 1.5 gigabits per second. This is a record breaker as the world's first terahertz wireless communication achieved with a small semiconductor device. The chip's ability to transmit at such a quick speed is not the end of the story. Even higher transmission speeds of up to 30 Gbps may be possible in the future, according to reports.

Rohm's breakthrough, as described by [DailyTech](#), involves the use of a micro-antenna that integrates the oscillation device and the detection element onto the semiconductor baseplate.

The company hopes to start mass-producing the chip in three to four years.

The experiment is also attracting attention because the Rohm and Osaka University researchers are using [terahertz](#) waves, a part of the electromagnetic spectrum under active exploration in technology circles. This is the first time that Terahertz frequency is being used in a [semiconductor device](#) of such a small size for data transmission. Production of this chip would come at an attractively low price as well, estimated at US \$1.30 per module, according to reports. Oscillation and detection devices that can be used in a terahertz band are said to be presently generally large and expensive. "The equipment needed to operate in those heights is large and expensive, but give a bandwidth of 0.1Gbps. This was top of the line until Rohm Semiconductors came out of nowhere touting speeds of 1.5Gbps in the 300GHz band," said one impressed tech [blog](#).

The 2cm by 1cm device, with an integrated antenna adapter, is the smallest ever made for this level of [wireless communication](#). Future interest will similarly focus on possibilities of achieving small, simple consumer devices that can be used in a terahertz band.

“Research into terahertz technology utilising Terahertz frequency (100GHz-10THz) is now receiving increasing attention around the world,” according to an Osaka University publication, and devices exploiting the waveband are set to become increasingly important in a wide range of applications.

One limitation on terahertz equipment has said to be its suitability only for indoor applications due to its vulnerability to interference from the atmosphere.

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