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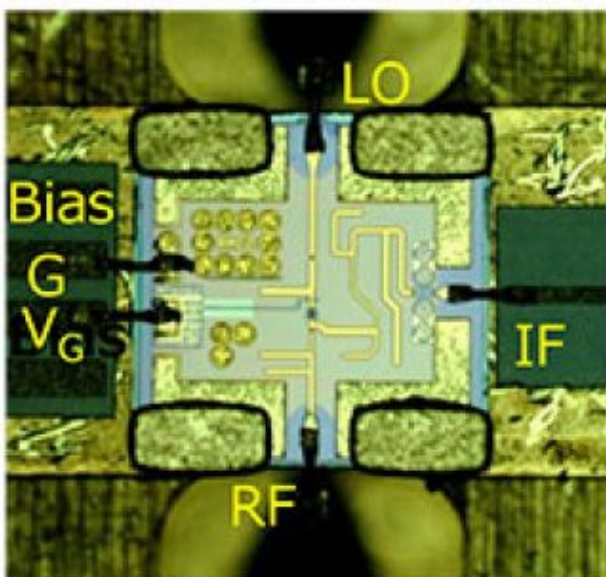
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## Japan's next generation terahertz communication will push to 400 gigabits per second

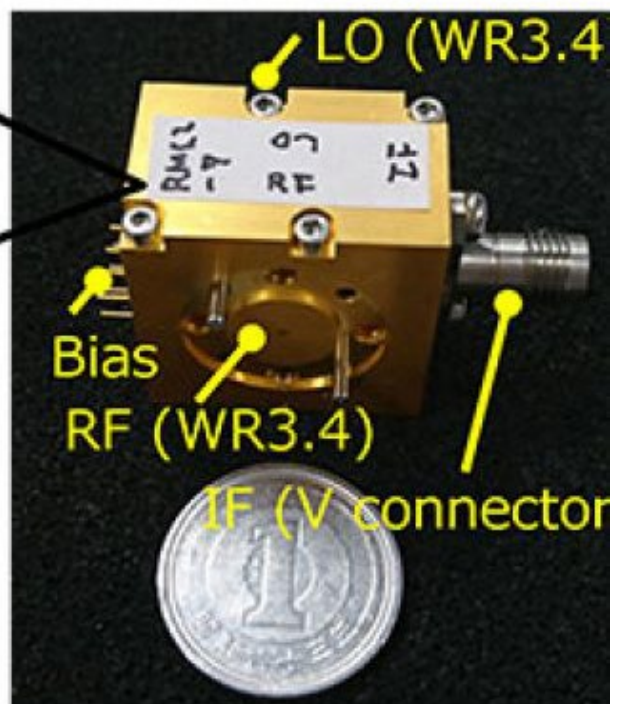
Brian Wang | June 13, 2018

300 GHz band mixer IC



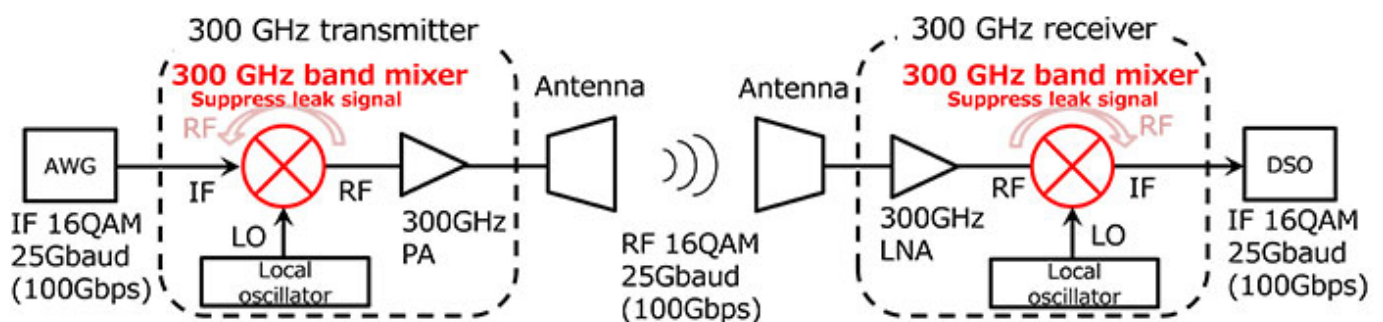
Chip size 1mm x 1mm

300 GHz mixer module



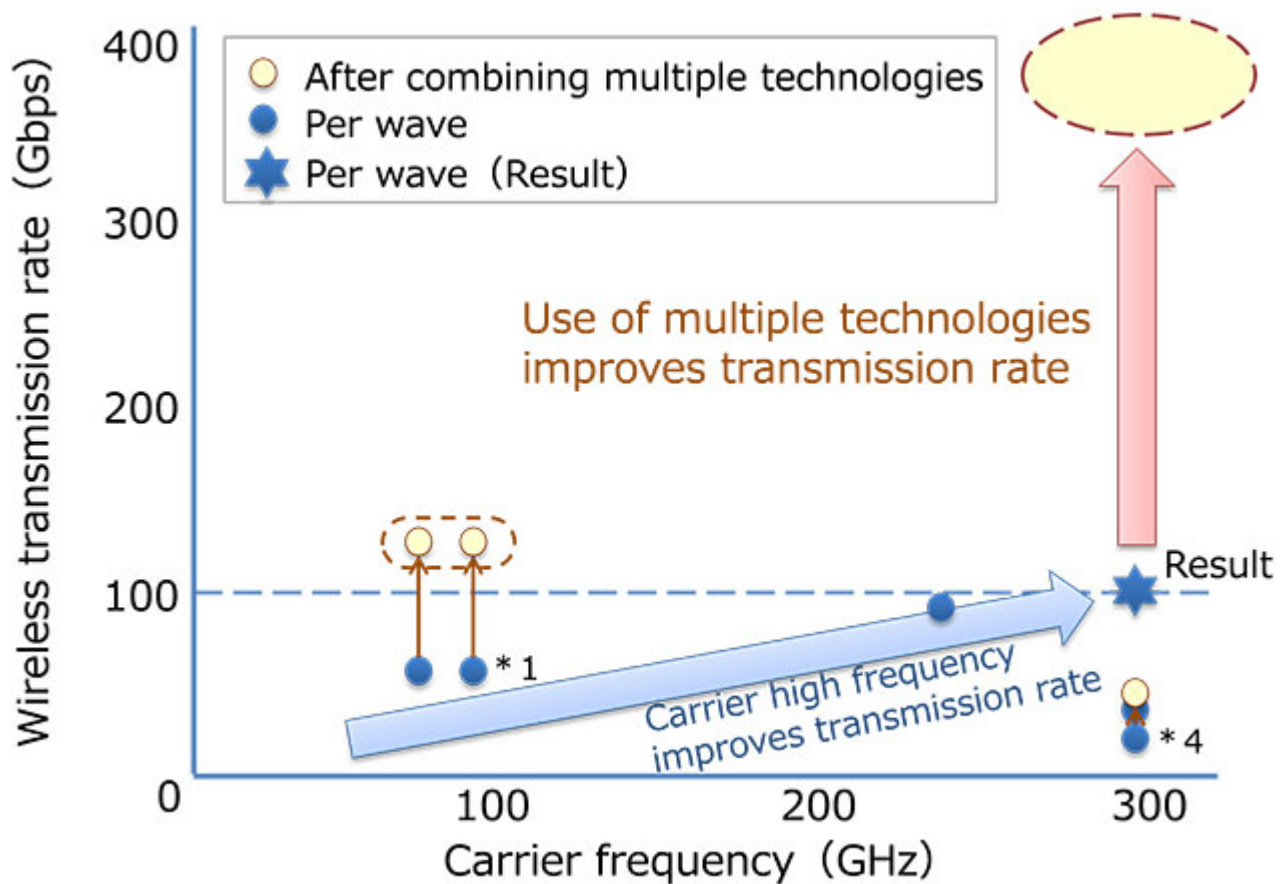
Nippon Telephone and Tokyo Institute of Technology have jointly developed an ultra high-speed IC for wireless front-end that operates on a terahertz frequency band, and in the 300 GHz band they have succeeded in developing the world's fastest 100 gigabit per second wireless transmission data rate.

Unused terahertz waves can be applied to high-speed wireless transmission since a wide frequency band can be secured. They implemented a mixer circuit that applied a unique proprietary high isolation design technology with an Indium phosphide high electron mobility transistor (InP-HEMT). This enlarged the transmission bandwidth, which is a problem in the conventional 300 GHz band wireless front end. It also improved the signal-to-noise ratio (SNR). They realized a 300 GHz band wireless front-end module, and we achieved wireless transmission of 100 Gbps (gigabits per second).



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This enables 100 Gbps wireless transmission with one wave (one carrier). They can extend to multiple carriers by making use of the wide frequency band of 300 GHz band, and use spatial multiplexing technology such as MIMO and OAM. It is expected to be an ultra high-speed IC technology that enables high-capacity wireless transmission of 400 gigabits per second. This is about 400 times the current LTE and Wi-Fi, and 40 times 5G, the next-generation mobile communication technology.

They developed an IC with an indium phosphide high electron mobility transistor (InP-HEMT).

The technology can be applied to imaging and sensing using terahertz waves.

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