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NTT and Tokyo Tech to develop ultra-high speed wireless transmission in the 300GHz band

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Japan

Japanese telecoms giant Nippon Telegraph and Telephone Corporation (NTT Corp) and Tokyo Institute of Technology (Tokyo Tech) have jointly developed an ultra-high speed integrated circuit (IC) for the wireless front-end operating on a terahertz frequency band. Further, the pair – who have stated their aim 'to pioneer the utilisation of unexplored terahertz wave frequencies' – claim to have successfully used the 300GHz band to develop 'the world's fastest 100Gbps wireless transmission data rate'.

In a press release, NTT Corp noted: 'It is expected that unused terahertz waves can be applied to high speed wireless transmission since a wide frequency band can be secured. In this research, we 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 300GHz band wireless front end. It also improved the signal-to-noise ratio (SNR). In addition, using this we realised a 300GHz band wireless front-end module, and we achieved wireless transmission of 100Gbps (gigabits per second).'

Whilst the tests were carried out with a single carrier channel, in future NTT and Tokyo Tech will use multiple carriers by making use of the wide frequency band at 300GHz, and use spatial multiplexing technologies such as MIMO and OAM. Ultimately, it is expected to be an ultra-high speed IC technology that enables high-capacity wireless transmission of 400Gbps – i.e. about 400 times that of current LTE and Wi-Fi technologies, and 40 times faster than 5G.

Japan, Nippon Telegraph and Telephone Corporation (NTT Corp), Wireless, 5G, LTE

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