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# Tokyo Scientists Develop Small 28GHz Transceiver for 5G



By Daniel Fuller June 12, 2018, 8:04am

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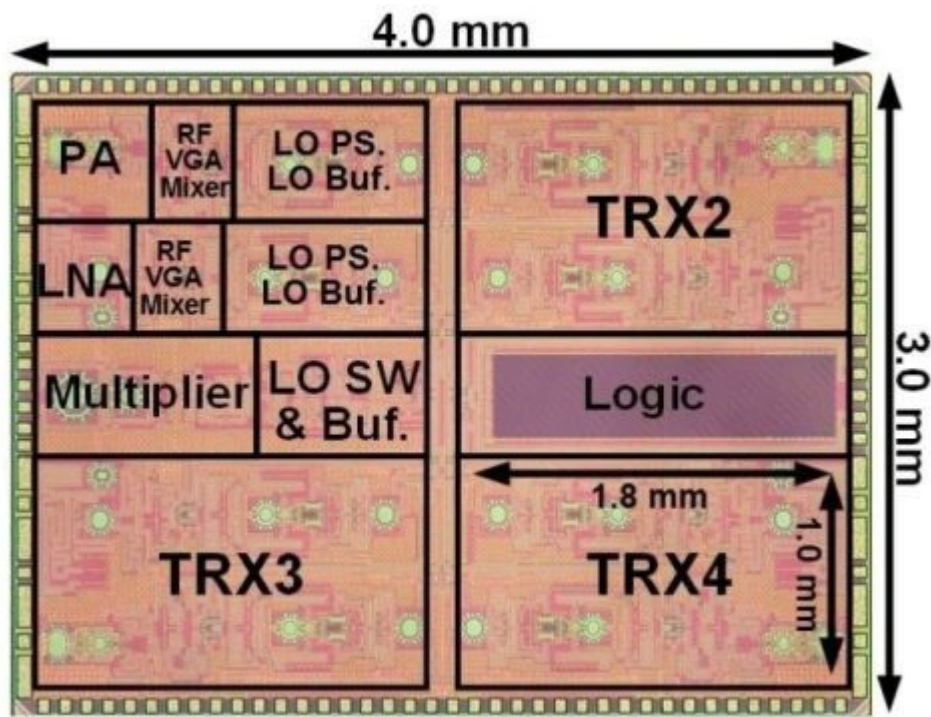


Researchers at the Tokyo Institute of Technology have created a **28GHz transceiver** that uses a local oscillator for phase shifting instead of usual RF shifting, making for more precise beam

steering and thus a more powerful, faster and more reliable connection for **5G gear**. This transceiver measures only 4mm by 3mm, and includes an onboard logic board along with all of the parts it needs to act as a complete radio solution, needing only the physical antenna and a power source to be provided by the host device. This new transceiver was able to best current 5G solutions in testing by about ten gigabits per second on average.

The new transceiver was not only faster than existing solutions, it maintained a lower rate of phase errors and gain variations, which means vastly more stable connections with fewer drops and easier handoffs. To put those notions to numbers, the local oscillator gear is able to rotate in increments as small as .04 degrees, making for a .1 degree beam-steering resolution. This translates into an extremely precise beam driven by reliable equipment that maintains gain variation that's near zero all over the entire 360-degree range of motion. This beats the RF phase shifters used in current 5G testing gear in literally every conceivable way when it comes to performance.

The team behind the new transceiver will be presenting it at 2018's IEEE Radio Frequency Integrated Circuits Symposium. While this transceiver will likely not become a commercial product, the team is hoping to use it as a proof-of-concept for the superiority of local oscillator phase shifting over the old RF method. If the entire industry collectively accepts the team's findings and adopts LO technology, you can expect 5G gear to be smaller, cheaper, faster and more reliable than current testing gear. There is still quite a while until the expected 2020 rollout date for commercial 5G devices and networks, though some OEMs and network providers are **jumping ahead** of that expectation a little bit. In any case, this means that there is still lots of time left for new developments such as this one to come along and shake things up before 5G devices land in consumers' hands.



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