

A more accurate, low-cost 39 GHz beamforming transceiver for 5G communications

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Researchers at Tokyo Tech and NEC Corporation, Japan, present a 39 GHz transceiver with built-in calibration for fifth-generation (5G) applications. The advantages to be gained include better quality communications as well as cost-effective scalability.



CMOS chips on an 18 mm x 163.5 mm evaluation-board

A team of more than 20 researchers at Tokyo Tech and NEC Corporation has successfully demonstrated a 39 GHz transceiver that could be used in the next wave of 5G wireless equipment including base stations, smartphones, tablets and Internet-of-Things (IoT) applications.

Although research groups including the current team have until now largely focused on developing 28 GHz systems, 39 GHz will be another important frequency band for realizing 5G in many parts of the world.

The new transceiver (shown in Figure 1) is based on a 64-element (4 x 16) *phased-array*¹ design. Its built-in gain phase calibration means that it can improve *beamforming*² accuracy, and thereby reduce undesired radiation and boost signal strength.