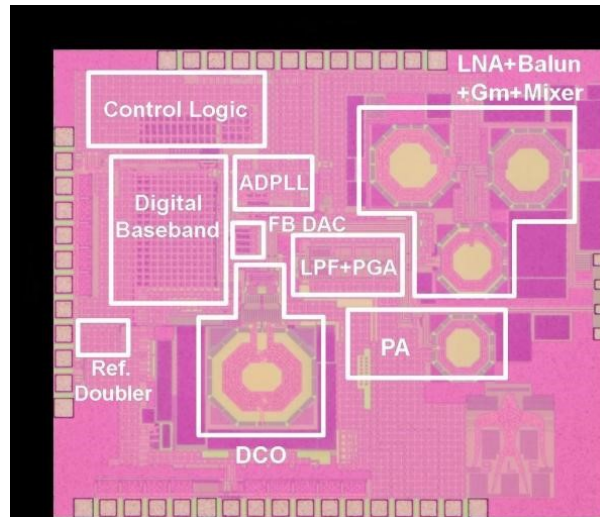

Bluetooth Low-Energy transceiver slashes consumption by over half

February 15, 2018 //By Jean-Pierre Joosting



Researchers at Tokyo Institute of Technology (Tokyo Tech) have announced a Bluetooth Low-Energy transceiver with the lowest ever power consumption, designed for use in the popular 2.4 GHz band.

The breakthrough set to accelerate widespread adoption of Internet of Things (IoT) applications was developed by a group of researchers led by Kenichi Okada of Tokyo Institute of Technology, Japan.

When transmitting, the transceiver consumes 2.9 milliwatts (mW) and when receiving, it consumes just 2.3 mW. Given that minimizing power consumption is a requirement for the oncoming IoT era, these figures are remarkable, as they represent less than half the power consumed by previous transceivers (see the table below).

	Tokyo Tech ISSCC 2018	Renesas ISSCC 2015	Dialog ISSCC 2015	Texas Instruments CC254	Nordic nRF51822
Transmitter	2.9	7.7	10.1	63	32
Receiver	2.3	6.3	11.2	58	39

Table: A performance comparison of BLE transceivers. Tokyo Tech's BLE transceiver achieves a dramatic reduction in power consumption – down to less than half of those previously reported. All figures are in milliwatts (mW).

The BLE transceiver has excellent receiver sensitivity – in their study the researchers achieved an impressive -94 decibels relative to 1 milliwatt (dBm). The receiver also exhibits high interference tolerance, while also realizing the lowest power consumption.

The transmitter employs an all-digital phase-locked loop (ADPLL), an attractive building block for BLE, as it is less susceptible to noise compared to its analog counterpart. The transceiver was designed in a 65-nanometer CMOS process.